



Technical Guide

2009 WiHD Plasma TV

Applies to model:

TC-P54Z1



Model TC-P54Z1

**Panasonic Service and Technology Company
National Training**

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Topics

Features

Connection

Signal Flow

Start-up Operation

Circuit Explanation

Shutdown Detect Circuit

Service Notes

Troubleshooting

Introduction

Z Series

A wireless Transmitter HDMI comes with the separate tuner/media unit, which sends digital wireless audio and video to the Display Unit.

The TV itself has no ports, and instead connects wirelessly to a separate box that handles all wired connections.

The flagship VIERA plasma in 2009 is the Z1 series, with a revolutionary one inch thin panel design and Wireless HD connectivity. to deliver the ultimate sleek, uncluttered HDTV viewing experience. VIERA CAST web menu with the new streaming HD movie rental capability via Amazon Video-on-Demand.

The Neo PDP design of the VIERA Z1 produces a brighter picture, deeper blacks, improved native contrast ratio (40,000:1) and Full-Time 1080 TV lines of motion resolution.

1080p resolution, a THX Certified Display; an Infinite Black panel; 600Hz Sub-field Drive; and VIERA Link, and VIERA Image Viewer for playing back digital still images and AVCHD videos recorded on SD Memory Cards.

Wireless HD technology can transmit full HD video signals, and audio and control signals wirelessly. This wireless transmission system was developed by Panasonic in collaboration with SiBEAM Inc. It can transmit uncompressed 1080p full HD content wirelessly with no deterioration in quality by using 60GHz millimeter wave radio. The picture on the screen goes undisturbed even when people interrupt the wireless communication path, and overcomes the highly directional nature of millimeter wave radio. This is achieved by incorporating beam steering technology.

Components Model Number



Ref#	Model Number	Description
1	TC-P54Z1	As System
2	TC-P54Z1M	Display Unit
3	TU-Z100U	Tuner Box
4	SP-54Z1U	Speaker
5	ST-54CF1WS	Pedestal
6	TU-WH1U	Wireless Unit (3 – 7 – 8 – Remote Control)
7	TU-WHT1U	Wireless Unit (Transmitter)
8	TU-WHR1U	Wireless Unit (Receiver)

Precautions

Radio waves from this TV may interfere with medical devices and automatic control devices.

- Do not place this TV in any medical institutions or locations with medical devices.
- Do not use this TV near any automatic control devices such as automatic doors or fire alarms.
- Keep the RF remote control, Tuner Box and Wireless Unit away at least 8.7 inches (22 cm) from the location where a cardiac pacemaker is implanted.
- Keep the transmitter away from the following devices as much as possible:

Microwave oven, Wireless LAN equipment, Bluetooth-compatible equipment, and equipments which use microwave of 2.4GHz band (Digital cordless phone, Wireless audio equipment, Game machine, Personal computer peripherals)

Wireless Unit Transmission Range

Use the Wireless Unit (Transmitter) within a straight line distance of 32 ft. (approx.) from the Wireless Unit (Receiver).

RF Remote Control Transmission Range

Use the RF remote control within the range of 7 m from the TV tuner.

Features

High Picture Quality

- THX® Certified Display
- Moving Picture Resolution 1080 Lines **
- 600Hz Sub- field Drive ***
- Infinite Black with Over 2,000,000:1 Dynamic Contrast (Native 40,000:1)
- 6,144 Equivalent Steps of Gradation
- 24p Cinematic Playback
- Deep Color
- New Louver Filter
- Studio Reference Mode
- Pro Setting

Others

- 1-inch Slim Design
- Long Panel Life, Up to 100,000 Hours
- Mercury and Lead Free Panel
- RF Remote Controller
- BBE® ViVA HD3D Sound

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** Based on APDC measurement method.

*** When using cinema mode.

Smart Networking

- Cable-free Design with WirelessHD™
- VIERA CAST
- VIERA Image Viewer Photo and Video (JPEG/AVCHD/MPEG2)
- VIERA Link (Connectivity with Network Camera)
- Game Mode
- PC Input

Power Consumption

Display Unit: (Maximum) 476 W

Tuner Box: 35 W

Wireless Unit: (Receiver) 12 W

Wireless Unit: (Transmitter) 10 W

Standby condition

Display Unit: 0.2 W

Tuner Box: 0.2 W

Weight

Display unit Including pedestal: 83.8 lb (38.0 kg)

Display Unit only: 70.6 lb (32.0 kg)

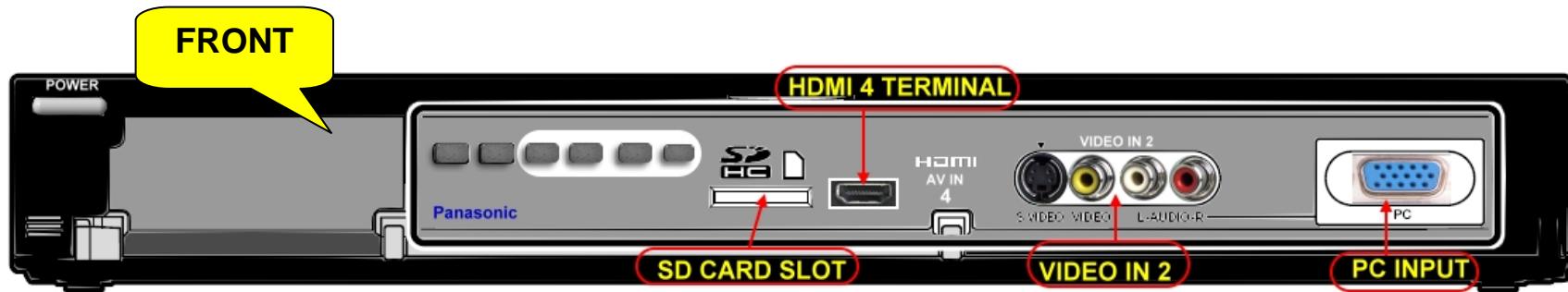
Tuner box: 6.7 lb (3.0 kg)

Wireless Unit (Transmitter): 0.7 lb (280 g)

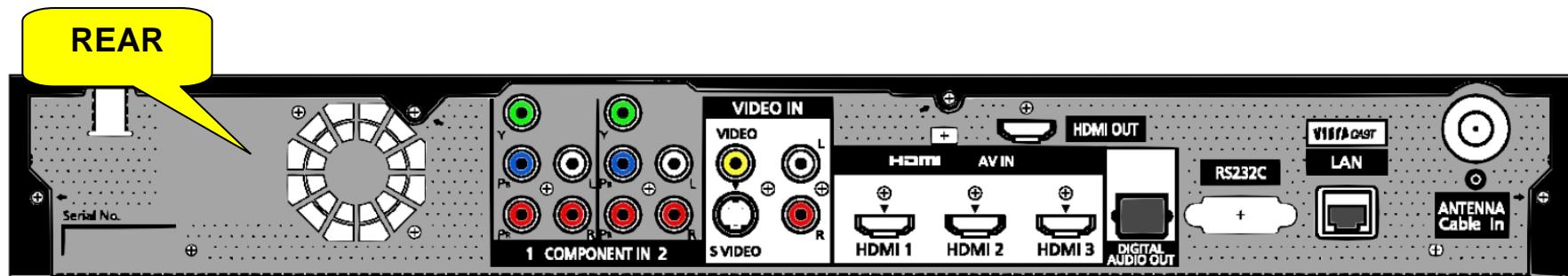
Wireless Unit (Receiver): 0.9 lb (400 g)

Tuner Box

The TV itself has no ports, it connects wirelessly to a separate box that handles all wired connections.



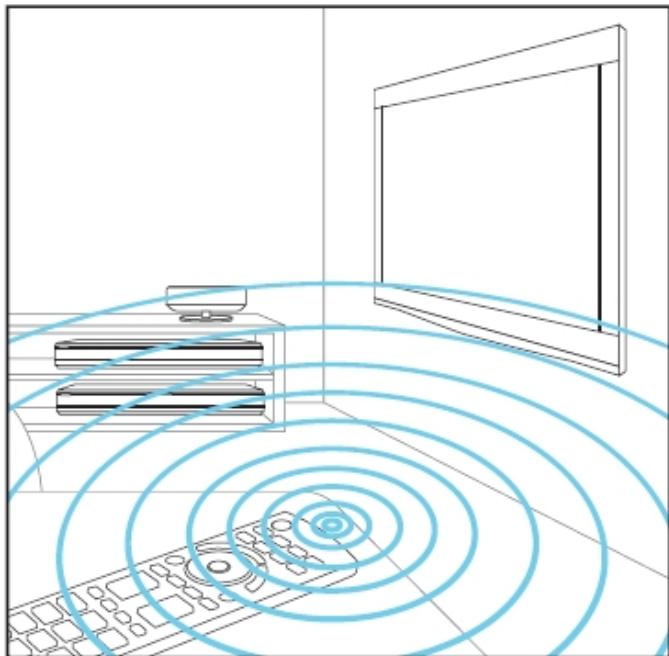
The front side of the box has a plastic panel, under which are its ports. The front side has an SD card slot, HDMI port, S-Video port, composite cable ports, and a PC input.



The back of the box has many ports. From left to right, you'll find two component cable input ports, a composite input port, three A-V HDMI inputs, an HDMI output, a digital audio output, a RS232C port, VIERA Cast LAN input, and an antenna cable in port.

(RF) Radio Frequency Remote Control

The signals that propagate all around the room can be used to operate equipment without having to worry about the direction that the remote control is pointed. This allows easy operation of a Tuner that is placed inside an AV rack.



The TV comes with a RF Remote Control.

The Tuner Box has RF Remote Control receivers. (The Box does not have an IR Receiver).

The Display unit does not have RF receiver but it has an IR Remote Control receiver.

An IR Remote control can also be used but it has to be pointed towards the TV

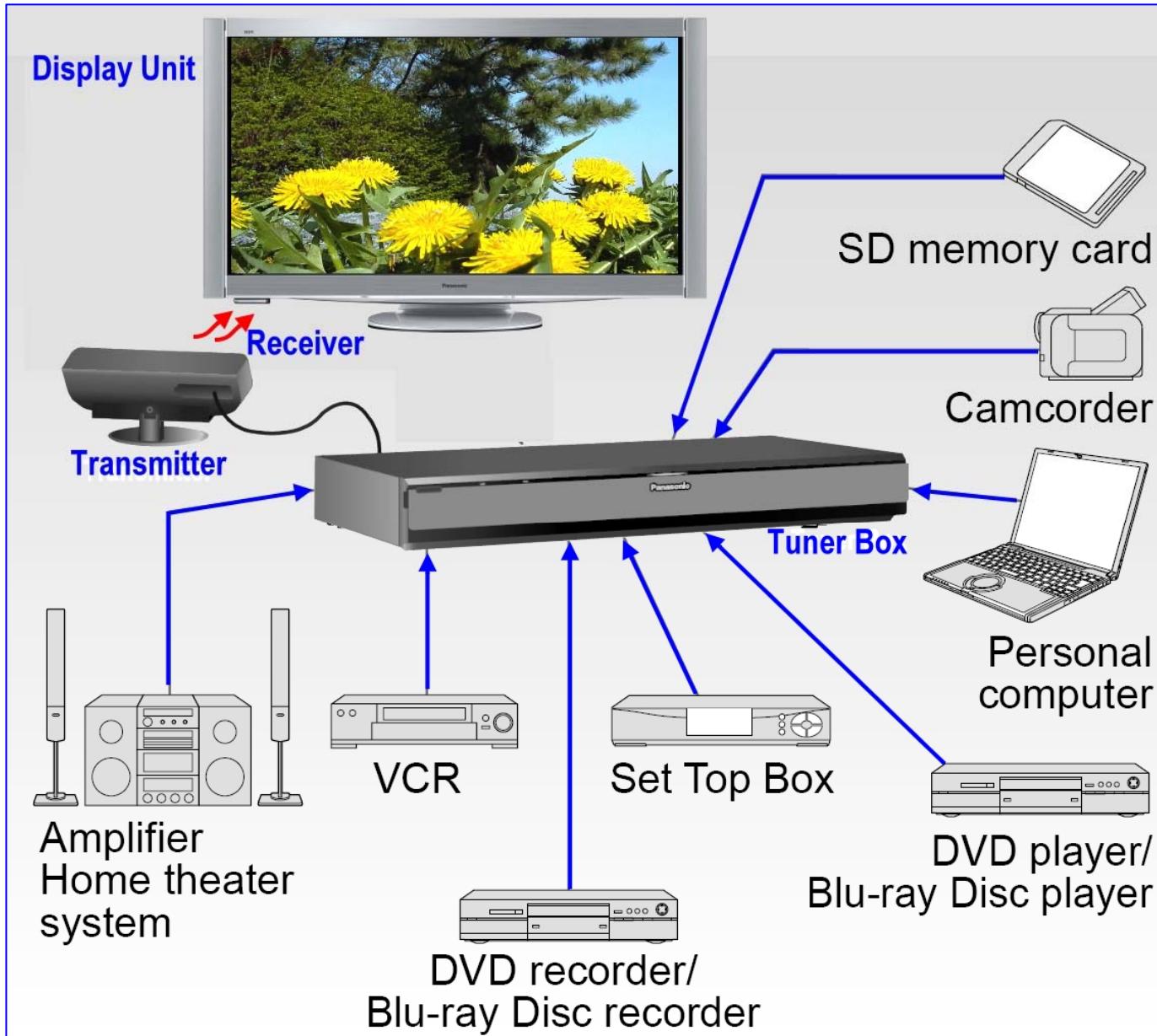


This remote control uses 2.4GHz frequency. Please do not place this control near any other device which may receive interference from the frequency.

Connection

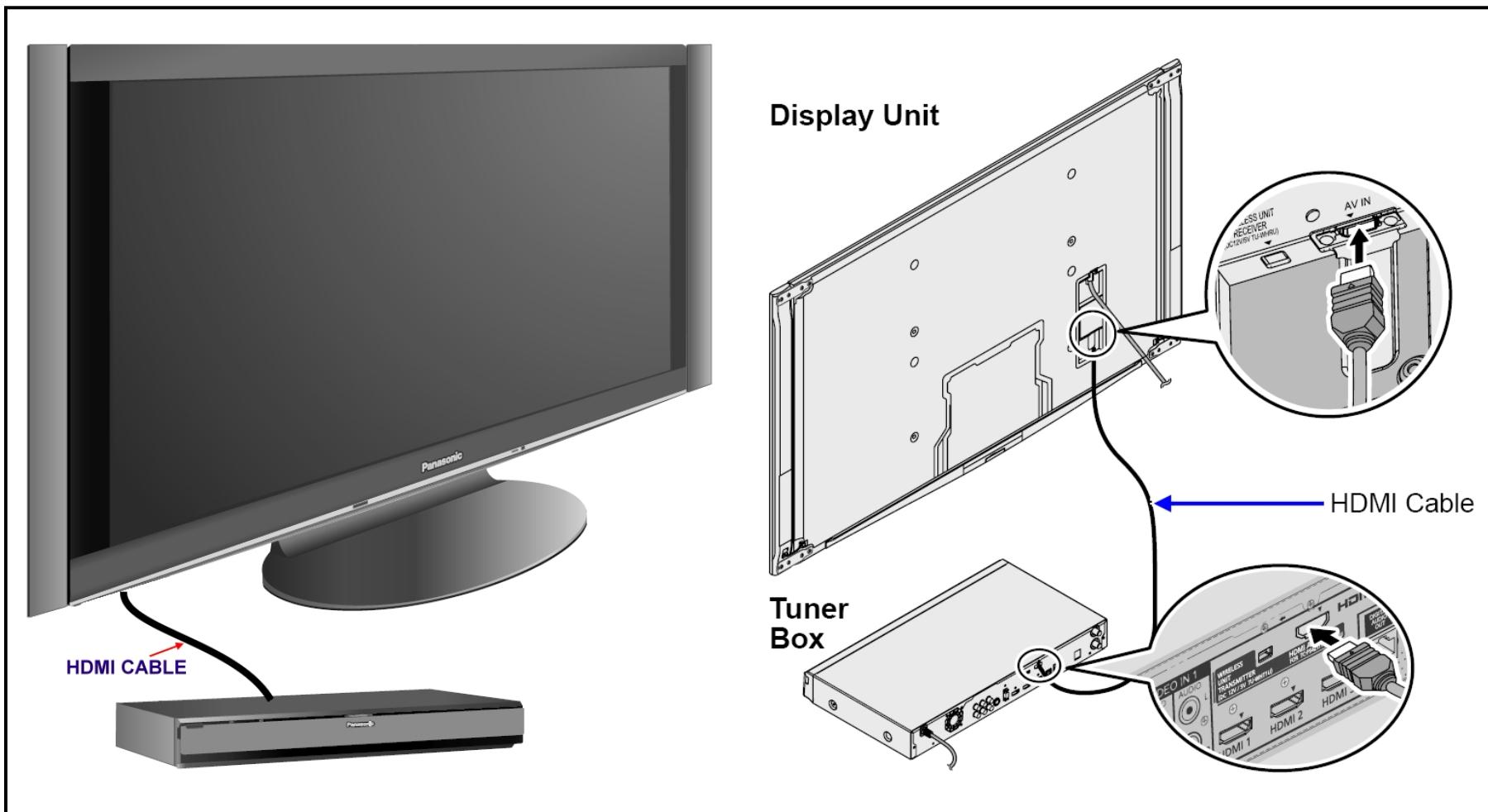
This Unit is designed to be connected wirelessly with the Tuner Box, but it can also be connected to the Tuner Box via the HDMI cable.

Connection



Wired Connection

The Display Unit can be connected directly to the Tuner Box using HDMI cable



If the TV is not operating because the Wireless Unit is defective, connect the Display Unit to the Tuner Box directly using the HDMI cable. The TV can be operated while the Wireless unit is being replaced.

Display Unit Only (Tuner Box Disconnected)

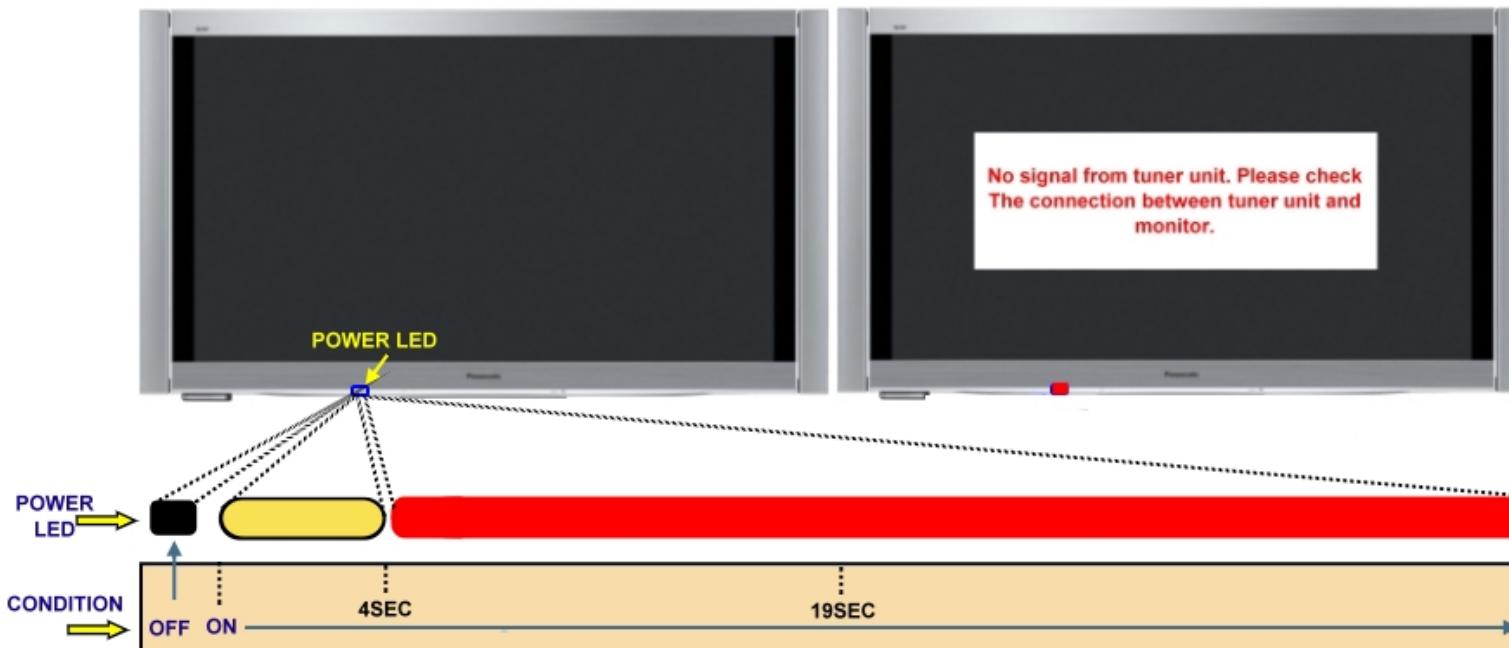
When the Display Unit is connected only to the WiHD Receiver, the power can be turned ON and Off only with the IR remote control when it's pointed at the Display Unit.

"No signal from tuner unit. Please check the connection between tuner unit and monitor" is displayed 20 seconds after the power button is pressed.

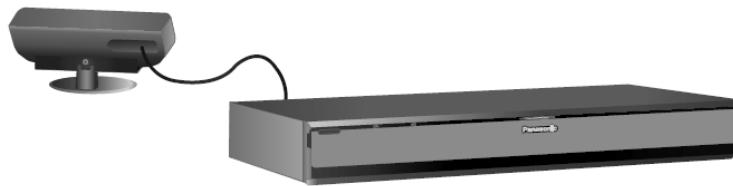
There's no OSD shown when any of the R/C buttons or the VOL+, VOL-, CH+, or CH- buttons on the TV are pressed.

OSD (Service Mode Menu) can be obtained when the IR remote control, combined with the VOL- button on the TV is used to enter the Display Unit Service Mode.

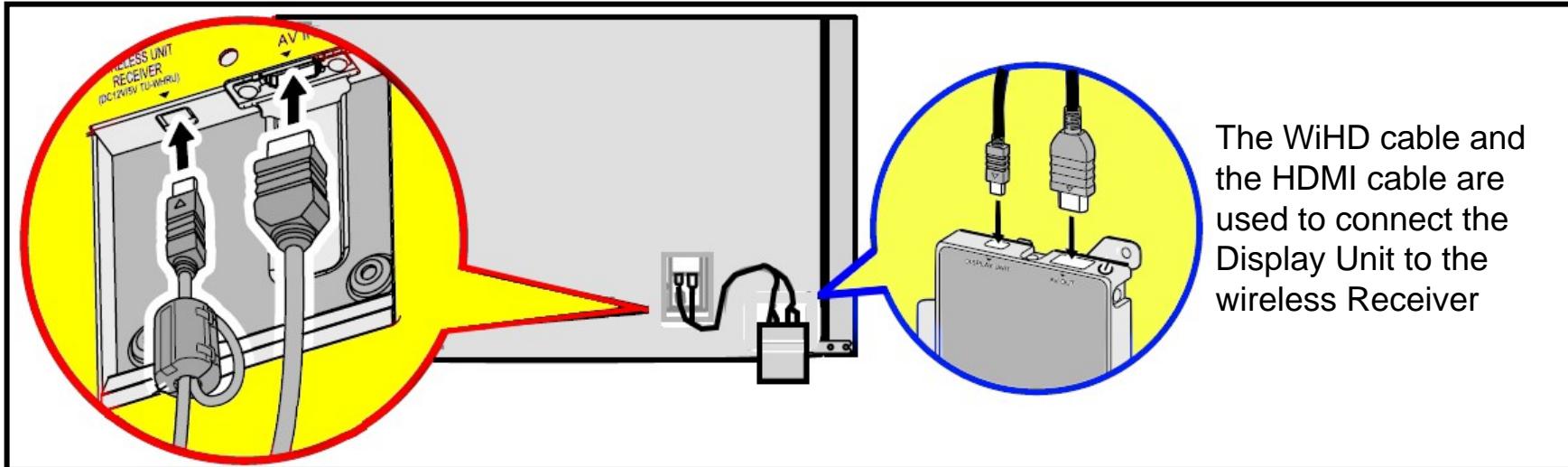
Display Unit Connected By Itself (No Tuner Box)



Wireless Setup



Normal Wireless Connection



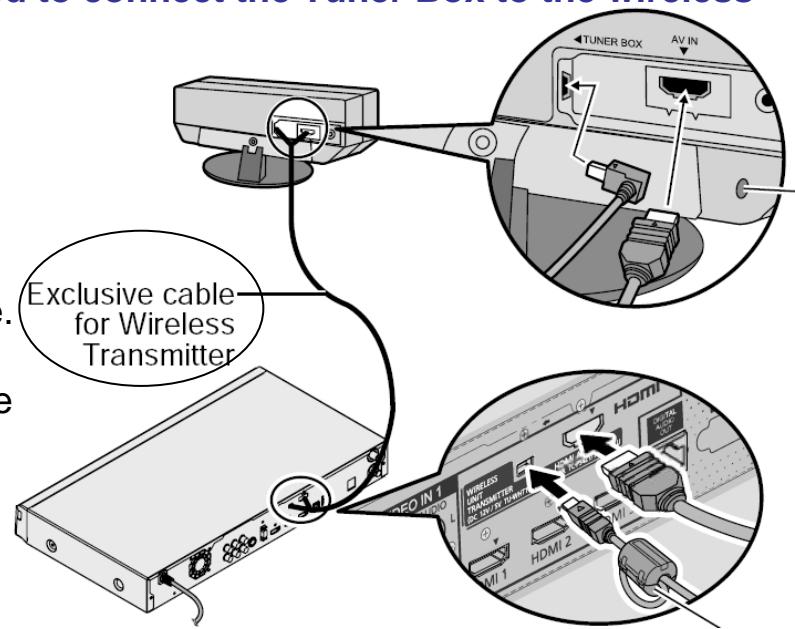
The WiHD cable and the HDMI cable are used to connect the Display Unit to the wireless Receiver

The special WiHD cable and the HDMI cable are used to connect the Tuner Box to the wireless Transmitter

Note:

1. Do not connect any other device than Wireless Unit to the HDMI terminal of the Display Unit/Tuner Box.
2. Connect the Exclusive cable for Wireless Transmitter which has ferrite core to Tuner Box side.

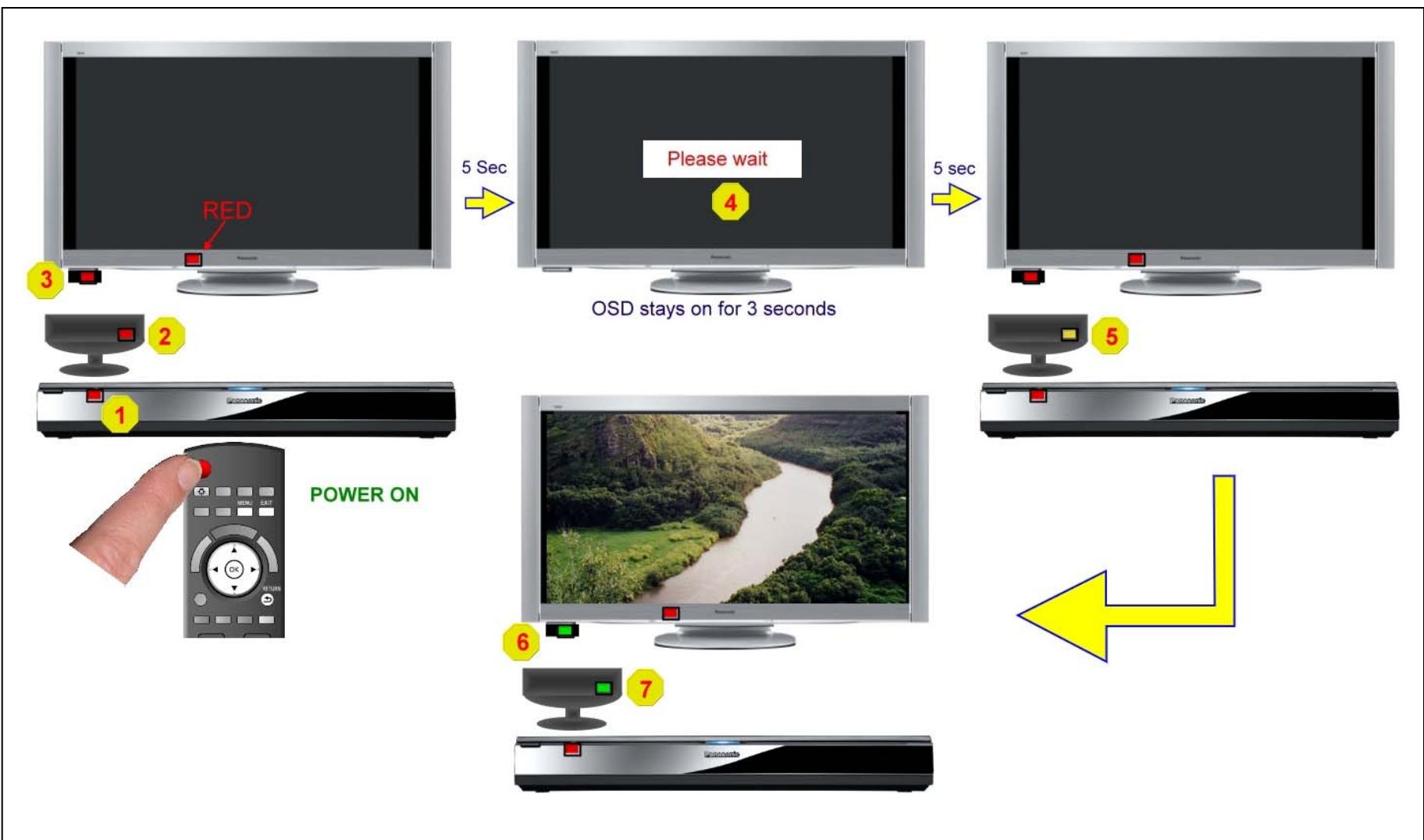
If the connection is not correct, the following icons will be displayed when the Display unit and the Tuner box are turned on.



This Display Unit is connected to a device other than Tuner Box.

Devices LEDs Sequence at Power On (Wireless Connection)

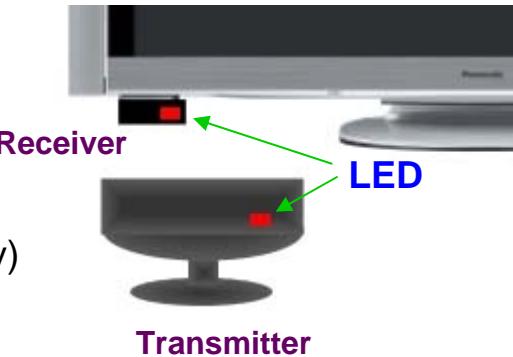
Reception Status LEDs



Reception Status LEDs

Transmitter Unit and Receiver Unit.

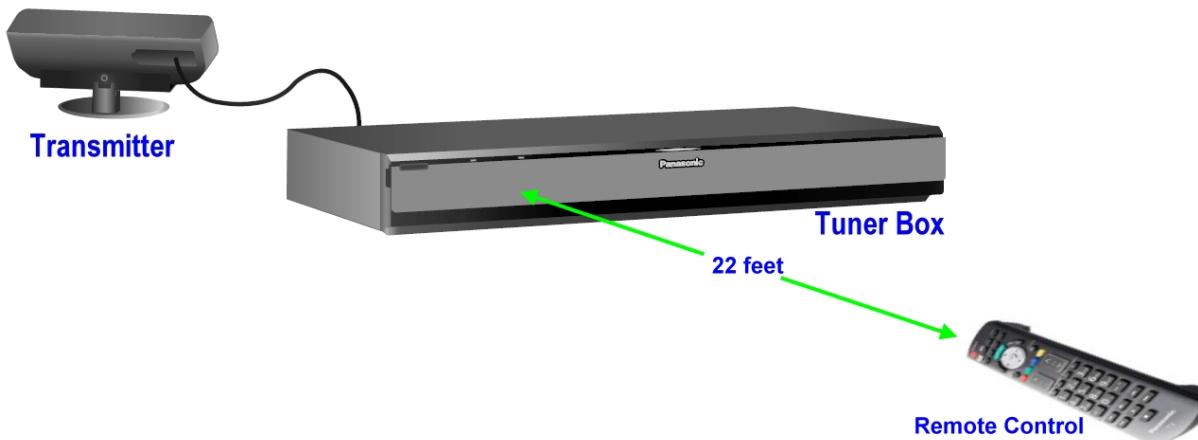
- Off: Power off
- Red: Power on and no communication
- Green: Power on and good communication
-  Red (blinking): Indicates malfunction
- Orange: Power on and communication problem (Transmitter Only)



Remote Control Transmission Range

The RF remote control should be used within 22 feet from the Tuner Box.

The range may be shortened if there are any obstacles or the surrounding environment or building structure affects the transmission.



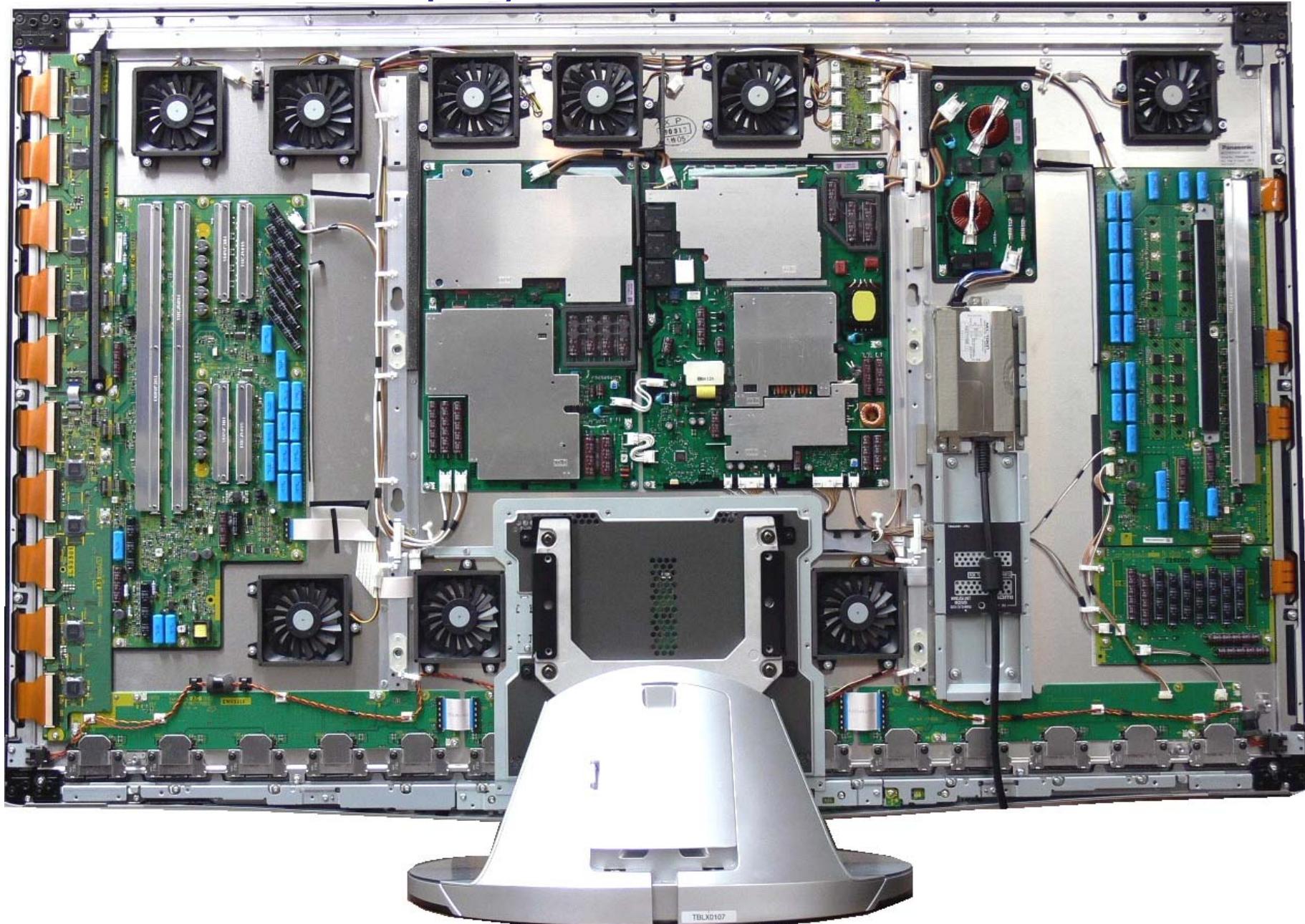
Interference from Other Devices

If the TV tuner is too close to another device, failures such as malfunction or slow remote control response may occur due to the radio wave interference.

Keep the transmitter away as much as possible from Wireless LAN, Microwaves, Telephones, Other electric devices

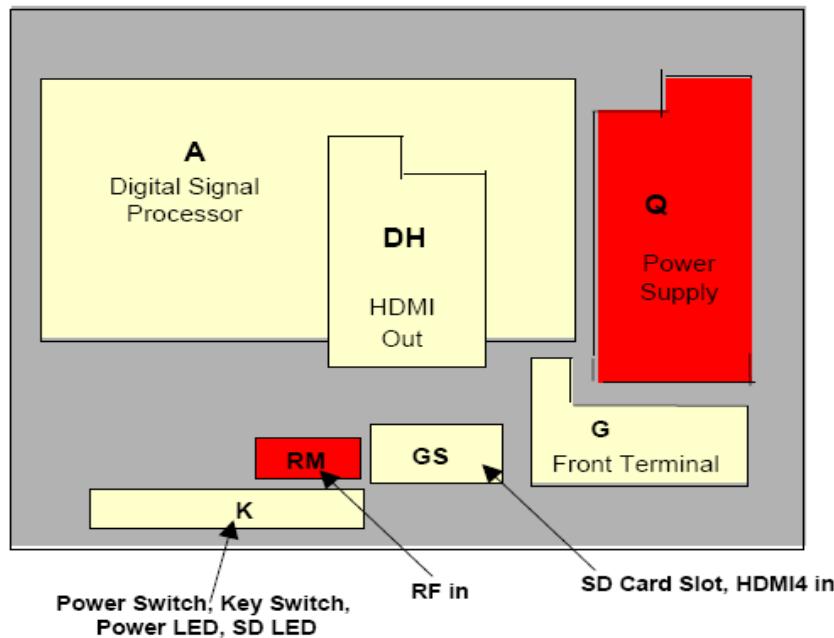
Board Layout and Description

Display Unit Board Layout

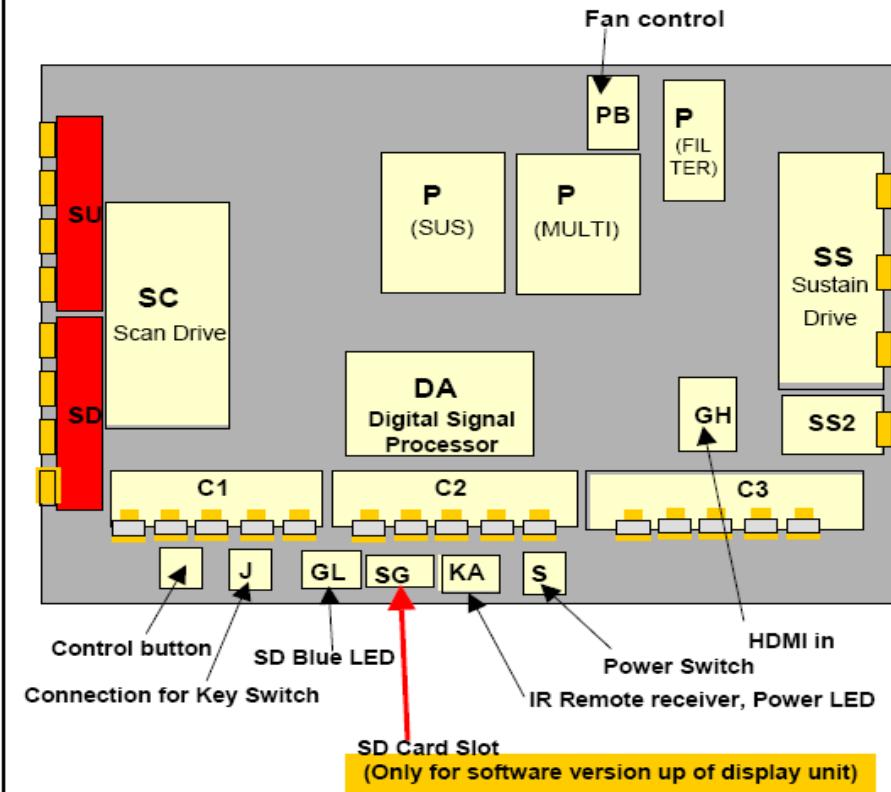


Boards Layout

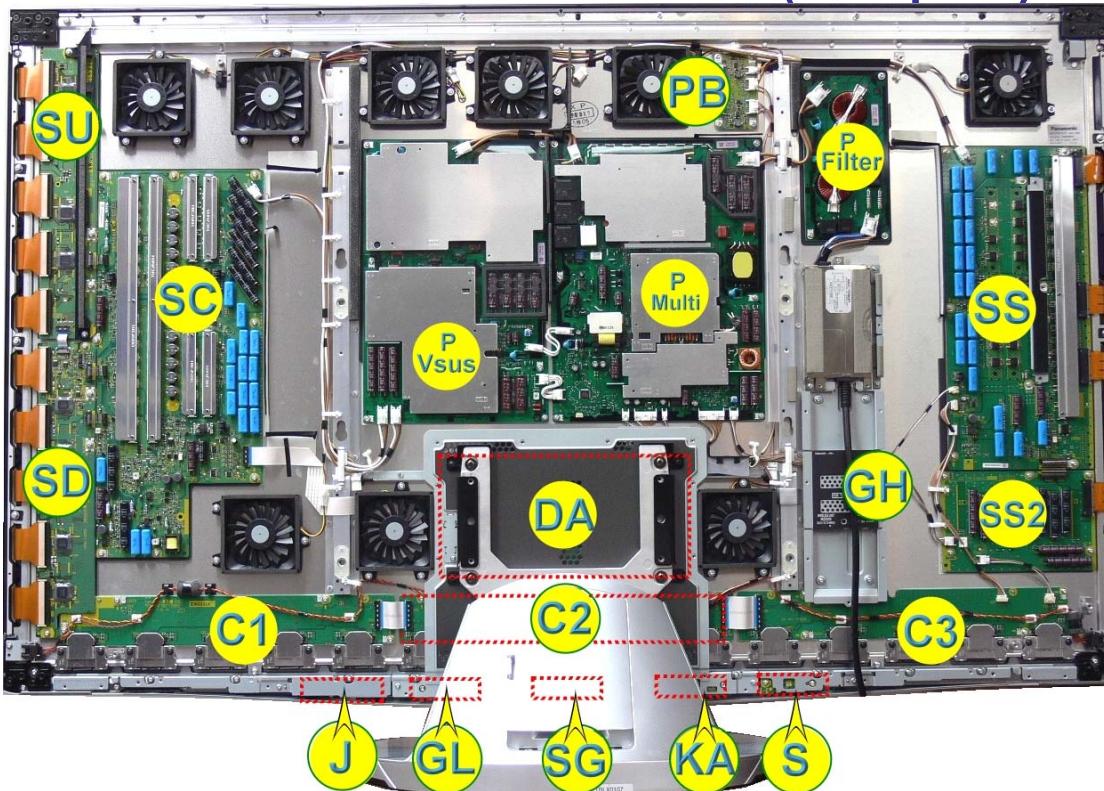
Tuner box (TU-Z100U)



Display unit (TC-P54Z1M)

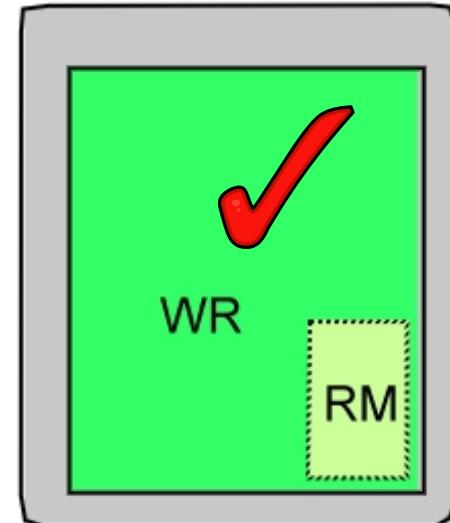
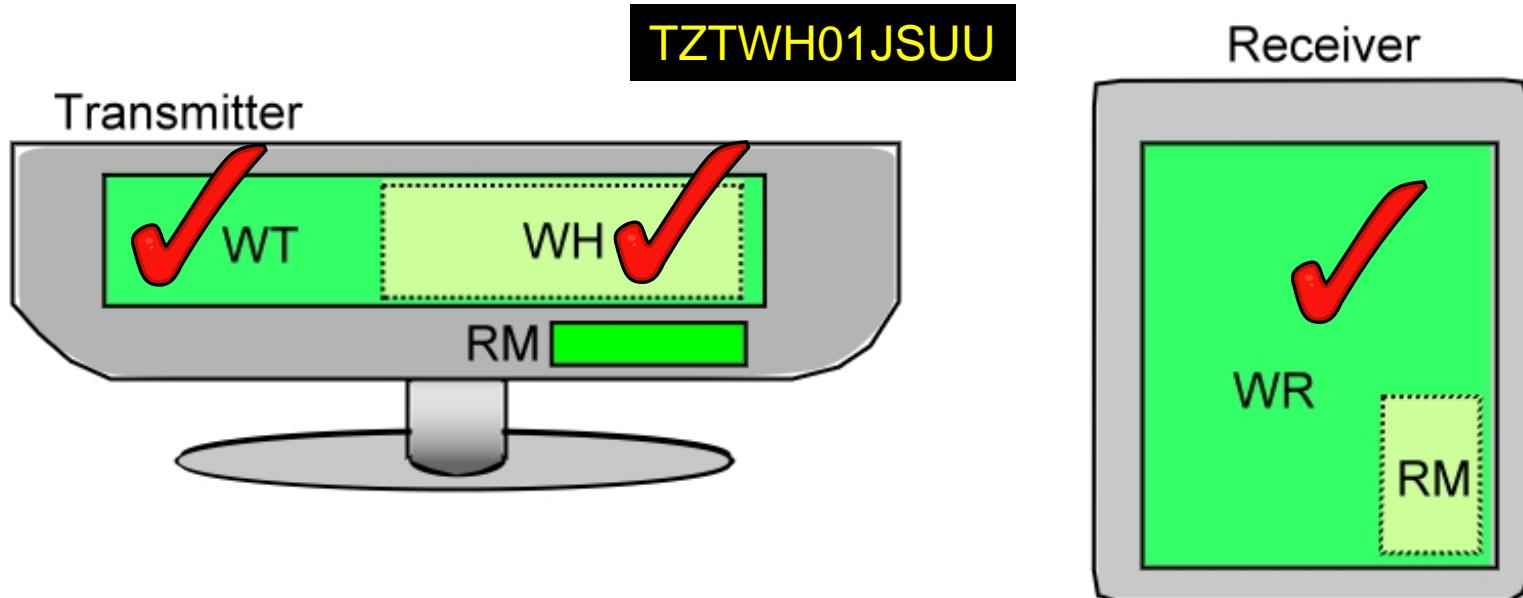


Board Name and Location (Display Unit)



Board Name	Function	Board Name	Function
P	Power Supply	C1	Data Driver (Lower Right)
DA	Digital Signal Processor	C2	Data Driver (Lower Center)
GH	HDMI in	C3	Data Driver (Lower Left)
PB	Fan control	SC	Scan Drive
S	Power Switch	SU	Scan out (Upper) Non-serviceable. SU-Board should be exchanged for service.
KA	IR Remote receiver, Power LED, C.A.T.S sensor	SD	Scan out (Lower) Non-serviceable. SD-Board should be exchanged for service.
SG	SD Card Slot		
GL	SD Blue LED		
J	Connection for Key Switch		
		SS	Sustain Drive
		SS2	Sustain connector (Lower)

Transmitter/Receiver Board Layout



Wireless Unit (Transmitter)	
Board Name	Function
WT	WiHD Transmitter
WH	WiHD Host
RM	RF Tx

Wireless Unit (Receiver)	
Board Name	Function
WR	WiHD Receiver
RM	RF RX

The initial security settings for copyright protection are done at the factory. For this reason, The WT and WH boards in the Transmitter and the WR board in the Receiver should be replaced at the same time.

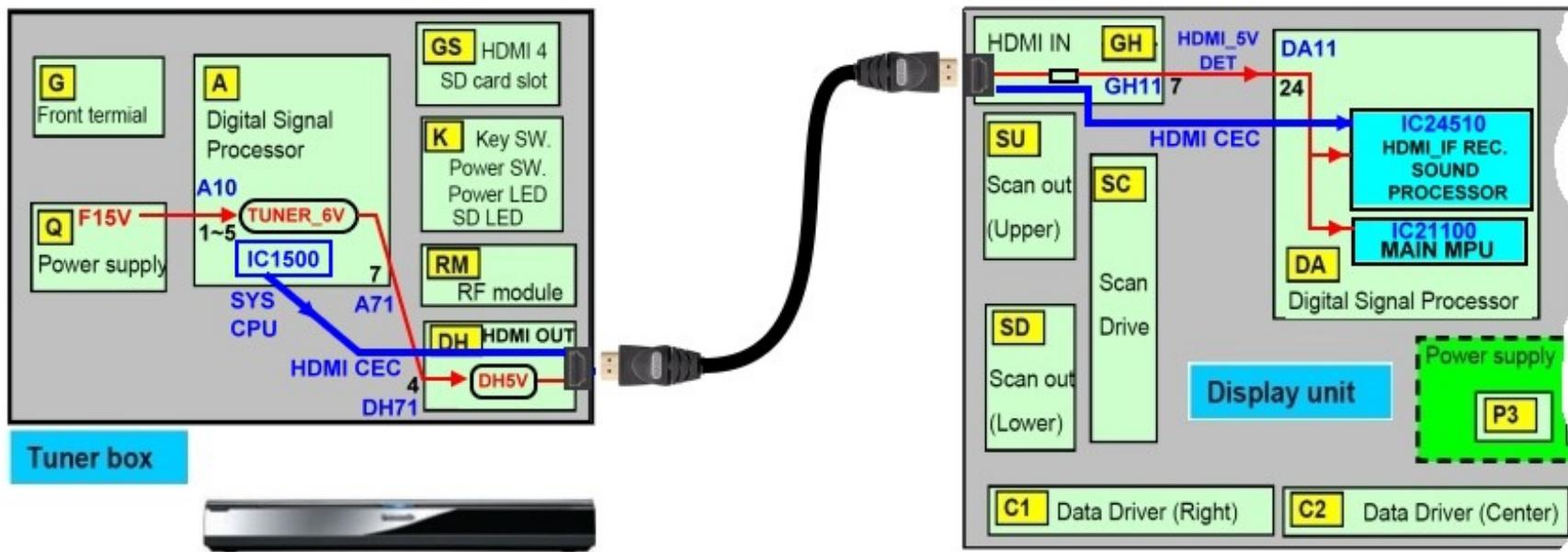
The part number for the “TRANSMISSION/RECEIVE UNIT” is TZTWH01JSUU.

Signal Flow

Wired Connection

When the Display Unit is directly connected to the Tuner Box via the HDMI cable, the IR and RF remotes can operate all the functions of the TV.

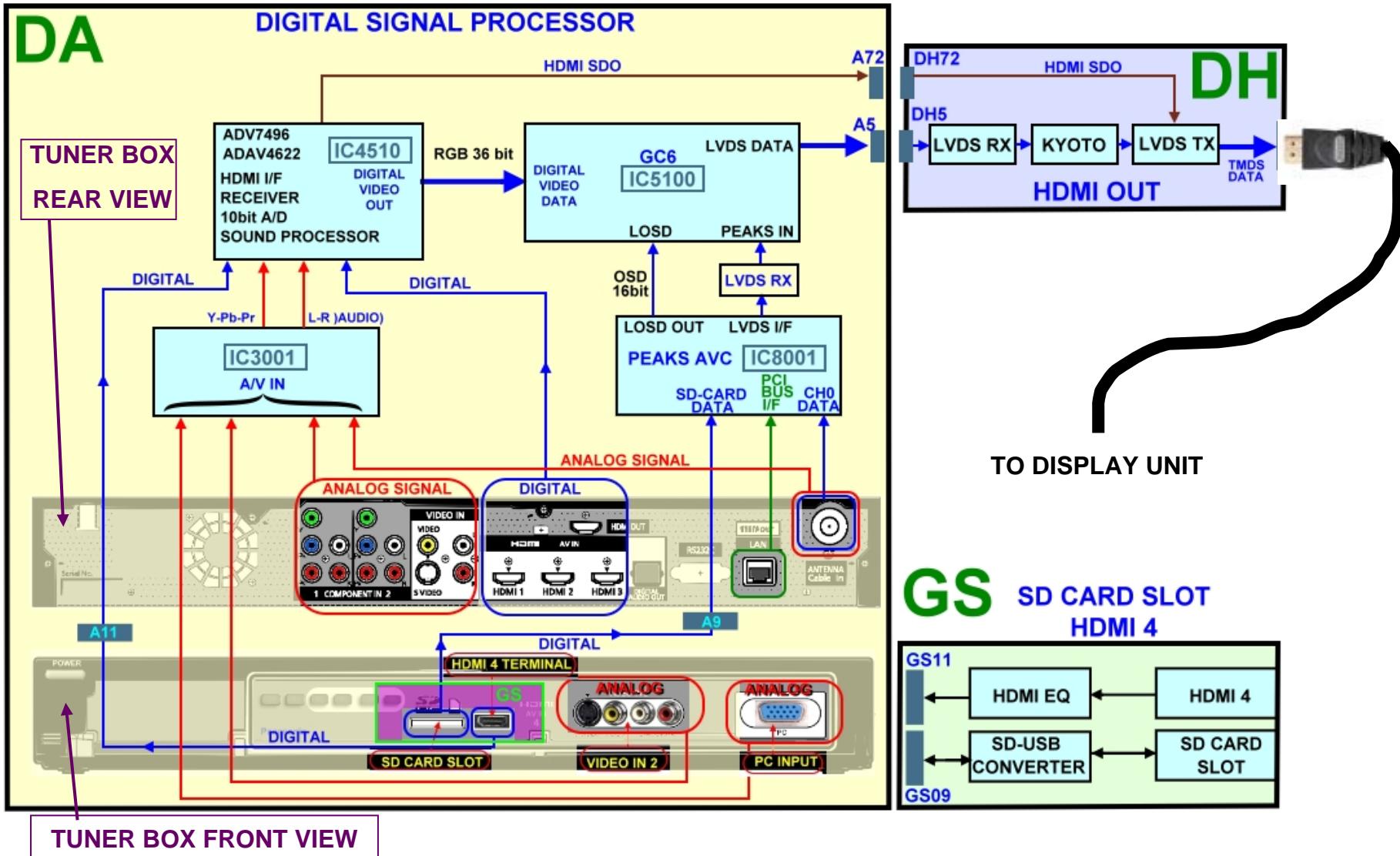
Note: The WiHD cable does not have to be connected when the Display and the Tuner are wired connected.



The Tuner Box communicates with the Display Unit via the HDMI cable making use of the DDC and CEC protocols.

The LVDS signal from the Tuner Box is output to the Display Unit through the HDMI cable.

Digital Signal Processing (Tuner Box)



Digital Signal Processing (Tuner Box)

Circuit Explanation

The main function of the A board is to select and process one of the incoming video signals. Video inputs 1 and 2, Component Video Inputs 1 and 2, PC input, and the composite video output of the tuner are all connected to IC3001 for selection. The video output signal of the switch can be in any of the three formats: Video, Y/C, or Y, Pb, Pr. The selected output enters IC4510 (HDMI I/F Receiver/ Sound Processor).

A comb filter inside IC4510 converts the composite video signal of the main picture to Y and C (luminance and chrominance) signals. S-Video, which is already Y/C separated, simply passes through the comb filter.

At the completion of this process, the format of the composite or S-Video signal is now the same as a digital 480i component signal. If the incoming video is in the 480p, 720P, or 1080i format, the Y, Pb, and Pr signals undergo A/D (analog to digital) conversion only. The 10 bit YUV data is provided to a video switch inside IC4510.

The HDMI signal from the HDMI ports is connected to IC4510 for selection.

The HDMI receiver section of IC4510 converts the incoming HDMI signals to a YUV video signal. The 36 bit RGB digital video signal is provided to the PEAKS AVC IC, IC5100.

Digital television reception of the tuner is output in the form of an IF (Intermediate Frequency) signal.

The transport stream from the tuner enters the VSB I/F (Interface) section of IC8001 where the video signal is extracted and converted to YUV data. The JPEG data of the SD card enters the JPEG I/F section of IC8001 for conversion into YUV data.

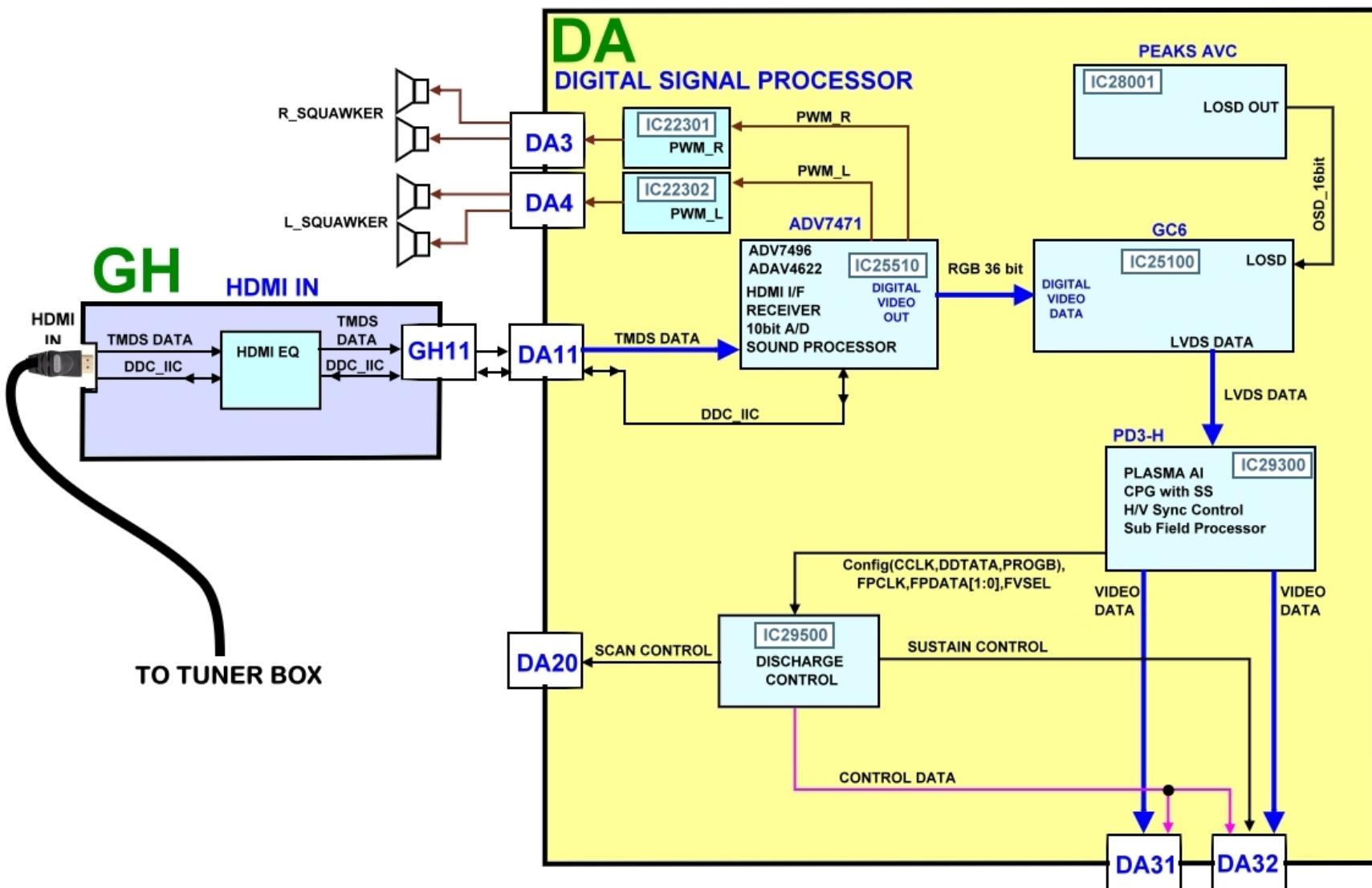
The PCI bus I/F signal is also connected to IC8001 for processing.

The selected picture data is then converted to LVDS signal and is then outputted to IC5100 (Global Core 6). OSD from IC8001 is mixed with the video signal inside IC5100.

The LVDS output from IC 5100 is provided to the DH board (HDMI Out). Here the audio signal from IC4510 is introduced to the LVDS transmitter circuit.

TMDS Data Clock, DDC IIC, and HDMI CEC from the LVDS transmitter circuit are provided to the Display unit through the HDMI cable.

Display Unit - Digital Signal Processing (Wired)



Display Unit - Digital Signal Processing (Wired)

Circuit Explanation

When the Tuner is wired to the Display, TMDS Data Clock, DDC IIC, and HDMI CEC from the Tuner are connected to the Display Unit via the HDMI cable.

The TMDS data and the DDC-IIC are provided to an Equalizer circuit in the GH board to equalize the signals encoded in the transition-minimized differential signaling (TMDS) format.

The Equalizer is used to compensate for signal decay and degradation due to cables and connectors via high-precision impedance matching.

It extends TMDS cable reach to the Display Unit allowing use of long cables.

In the DA board, the TMDS data and the DDC-IIC are connected to IC25510 (HDMI Receiver/Sound Processor) where the signal is processed.

The video and the audio are separated inside IC25510. The PWM audio is outputted to the audio amplifiers IC22301 and IC22302.

The processed 36bit Digital RGB Video Signal is output to the global core 6 (GC6) IC25100.

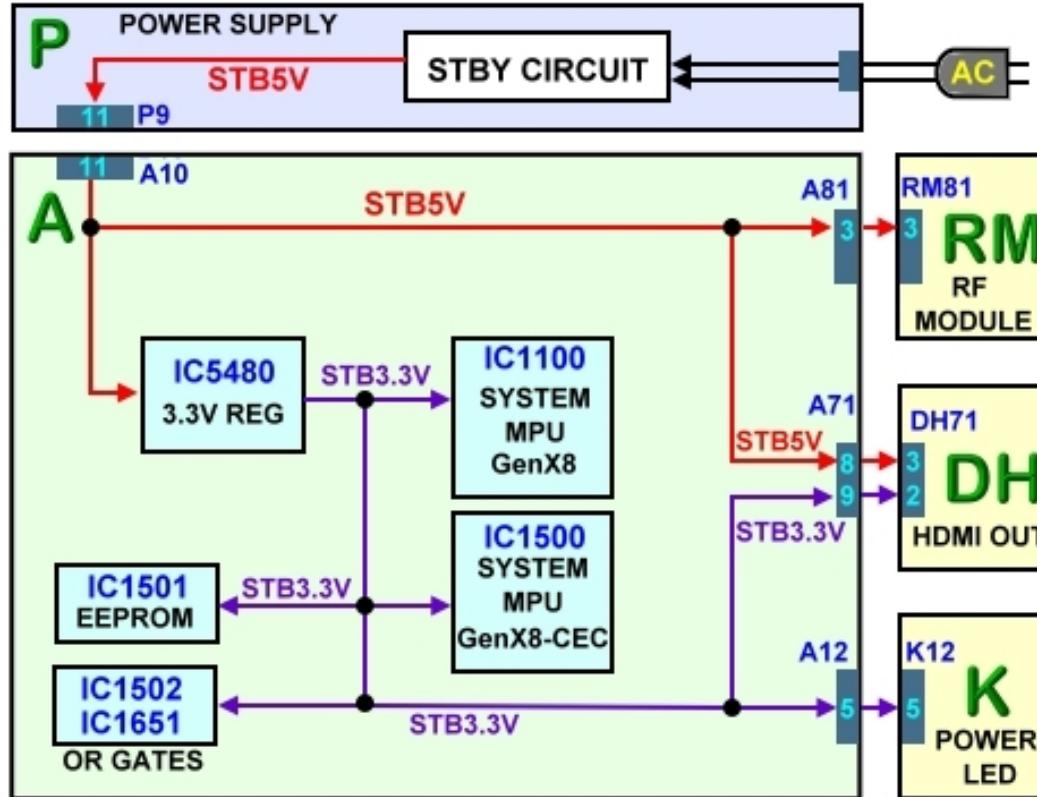
The Video signal is then mixed with the OSD data from the PEAKS AVC IC28001.

The signal is then converted to LVDS and is outputted to IC29300 (Plasma AI, Sub Field Processor, and HV Sync Control).

IC29300 outputs video data pulses to drive the data drive boards (C boards).

IC29500 outputs the sustain and scan control pulses to drive the scan and the sustain circuits in the SC and SS boards respectively.

Tuner Box STB5V – STB3.3V Distribution



STB5V - STB3.3V Distribution (Tuner Box)

The STB5V in the Tuner Box is generated when AC is applied to the P board.

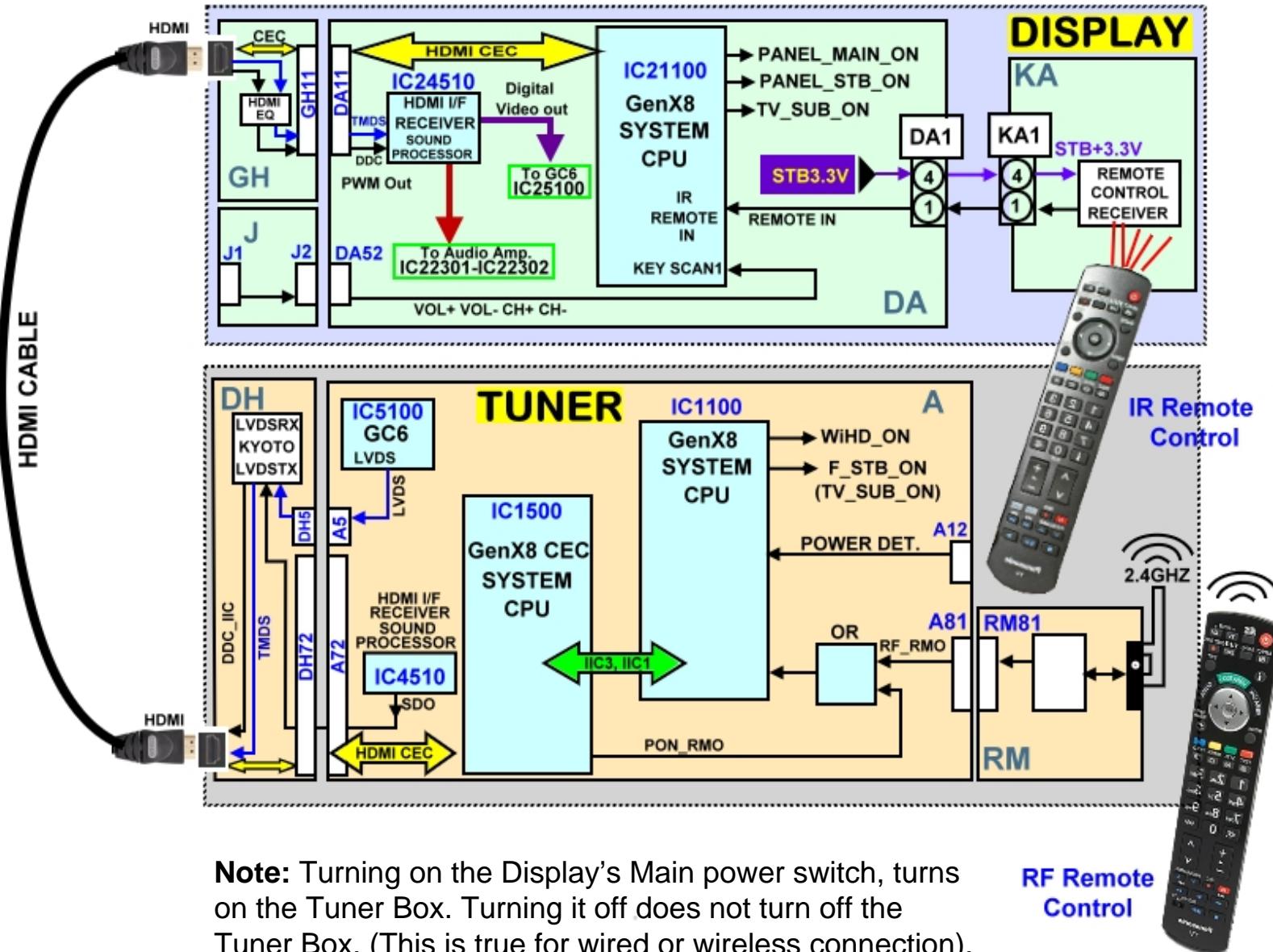
The STB5V enters the A board through pin 11 of connector A10.

STB5V is provided to the RM board (RF Module) and the DH board (HDMI Out).

STB5V is also connected to the 3.3V regulator IC5480. The STB3.3V supplies the System MPUs (IC1100 and IC1500), IC1501, IC1502, and IC1651.

STB3.3V is also connected to the DH and the K board.

Wired Connection (HDMI Only)



Wired Connection (HDMI Only)

The Unit can also be connected using the HDMI cable directly connected from the Tuner to the Display.

Both, the RF and the IR remote controls can be used to operate the unit.

The remote signal from the RF remote control is received by the Tuner Box and the IR signal from the IR remote control is received by the Display Unit.

With the Display's Main switch on, the TV can be turned on by:

Pressing the power switch on the RF remote control

Pressing the power switch on the IR remote control (Pointed at the Display Unit).

Pressing the power switch on the Tuner Box.

Note: Turning on the Display's Main power switch, turns on the Tuner Box. Turning it off does not turn off the Tuner Box. (This is true for wired or wireless connection).

CEC is a HDMI control feature that enables the Tuner Box and the Display Unit to control each other.

CEC stands for Consumer Electronics Control.

Based on a one-wire bidirectional system, the CEC line allows the Tuner and the Display to share a communication channel.

The LVDS signal from the Global Core 6 (IC5100) and the sound data from the sound processor IC4510 in the Tuner Box are applied to the LVDS transmitter in the DH board.

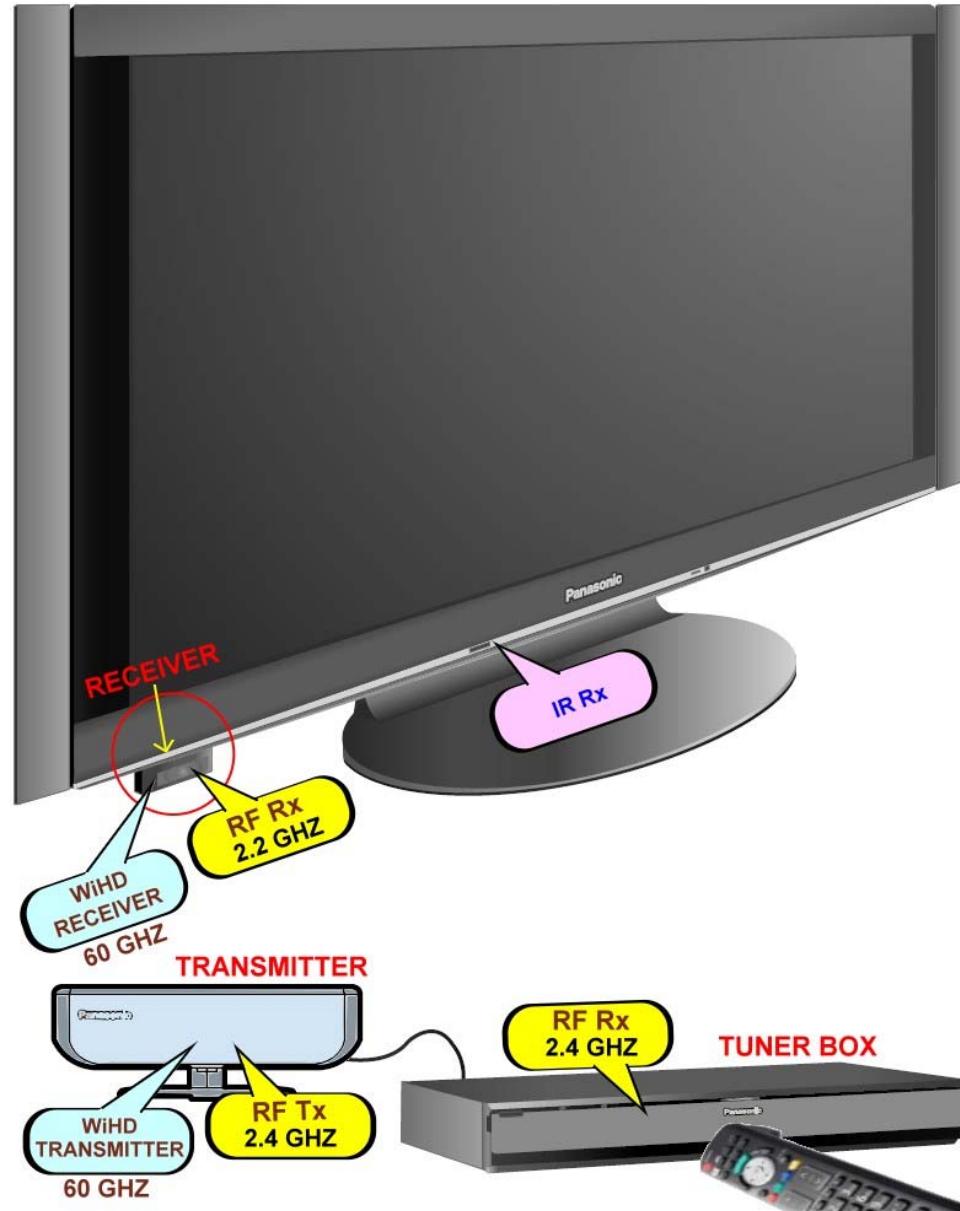
The CEC control signal from the GenX8 CEC System MPU (IC1500) and the LVDS data are transferred to the Display Unit via the HDMI cable.

The TMDS data and the DDC-IIC are provided to an Equalizer circuit in the GH board to equalize the signals encoded in the transition-minimized differential signaling (TMDS) format.

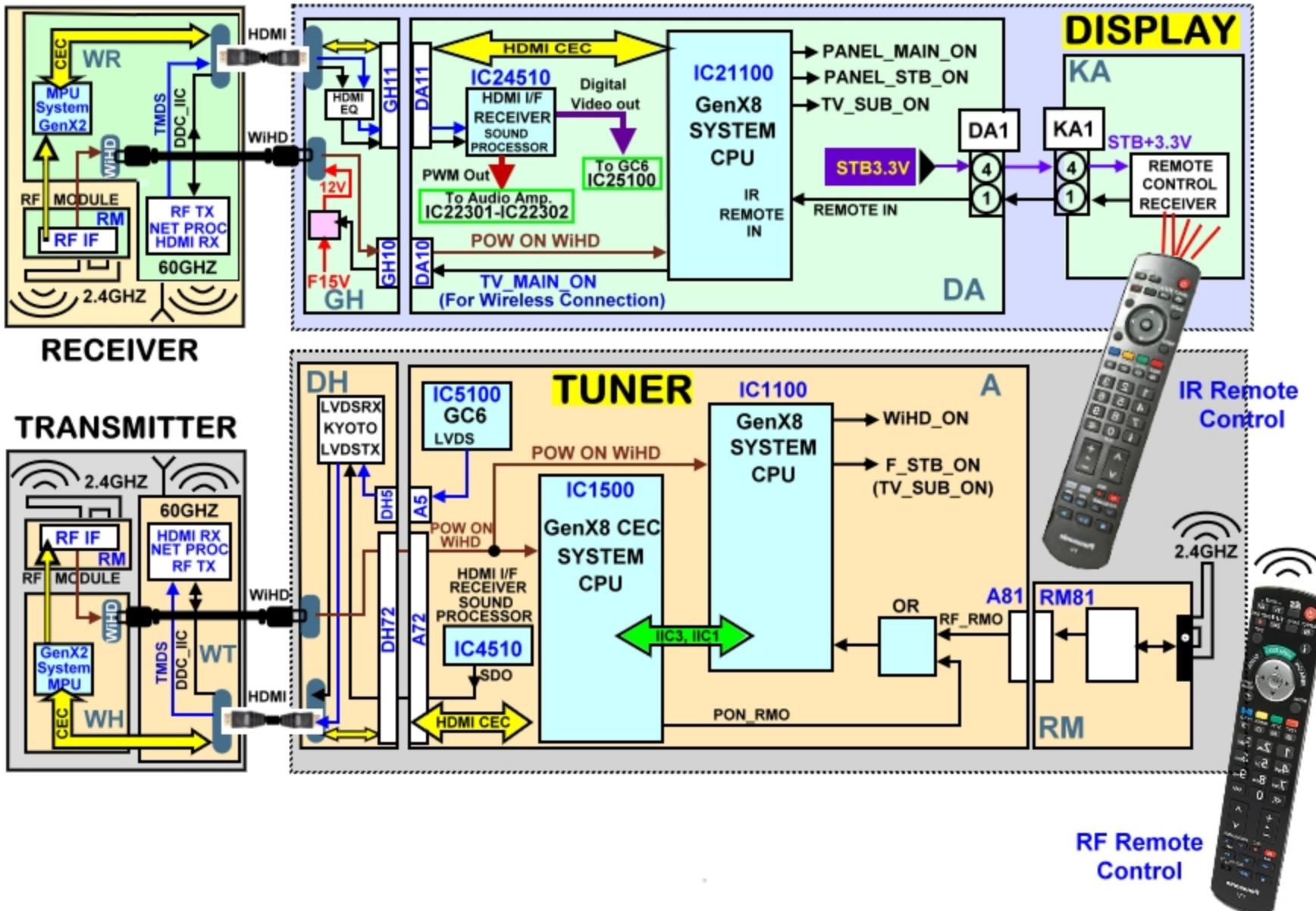
The Equalizer is used to compensate for signal decay and degradation due to cables and connectors.

The signal is then applied to IC24510 for processing.

Wireless Connection



Wireless Connection



Wireless Connection (Circuit Explanation)

The signal is wirelessly transmitted in 2 different frequencies.

The video and audio signal are converted to TMDS (Transition Minimized Differential Signaling) in the DH board of the Tuner Box.

The TMDS data is converted to RF signal and is transmitted as a 60GHz RF signal from the WT circuit in the WiHD transmitter module.

The control CEC signal is transmitted at 2.4GHz by the RF module (RM) in the transmitter unit.

The RF signals from the transmitter are picked up by the (2.4GHz and 60GHz) RF IF modules in the receiver unit.

The 60GHz signal from the transmitter is decoded to TMDS format and DDC-IIC.

The CEC, TMDS, and DDC-IIC are connected to the HDMI In (GH) board in the Display Unit.

The TMDS data and the DDC-IIC are provided to an Equalizer circuit in the GH board to compensate for signal decay and degradation due to cables and connectors.

CEC enables the Tuner Box and the Display Unit to control each other. CEC stands for Consumer Electronics Control.

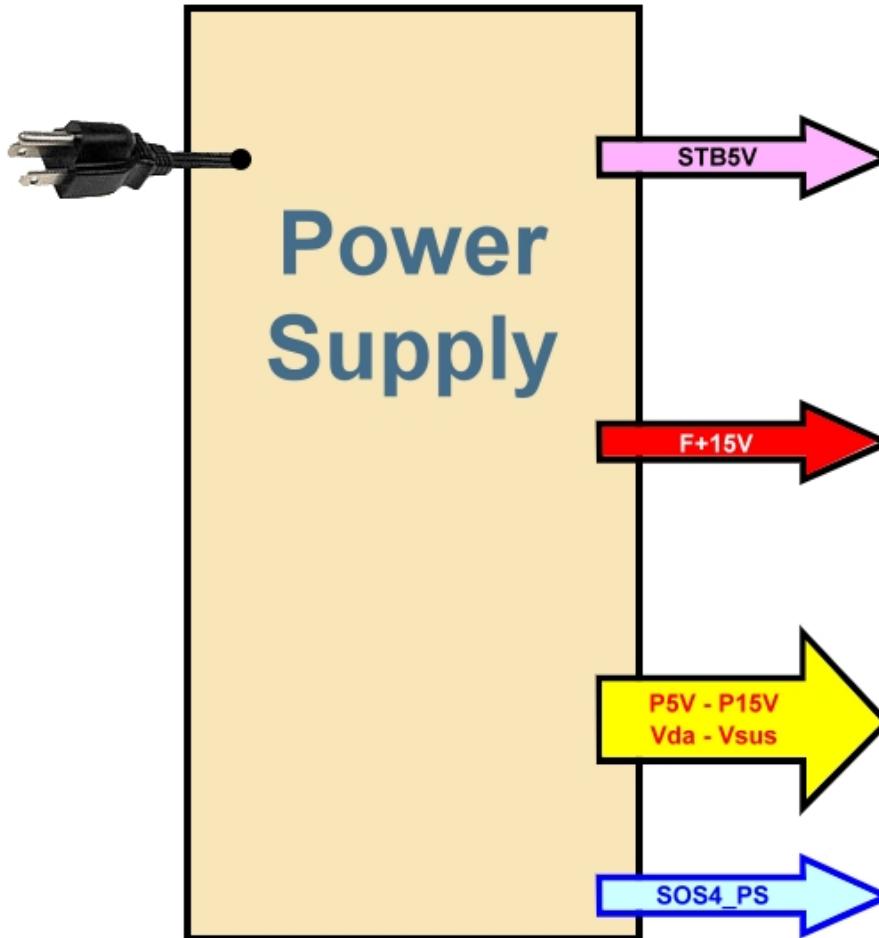
CEC, a one-wire bidirectional line allows the Tuner and the Display to share a communication channel.

The TMDS data and the DDC-IIC are applied to IC24510 for processing.

The video signal and the audio signal are separated in IC24510.

Start up Operation

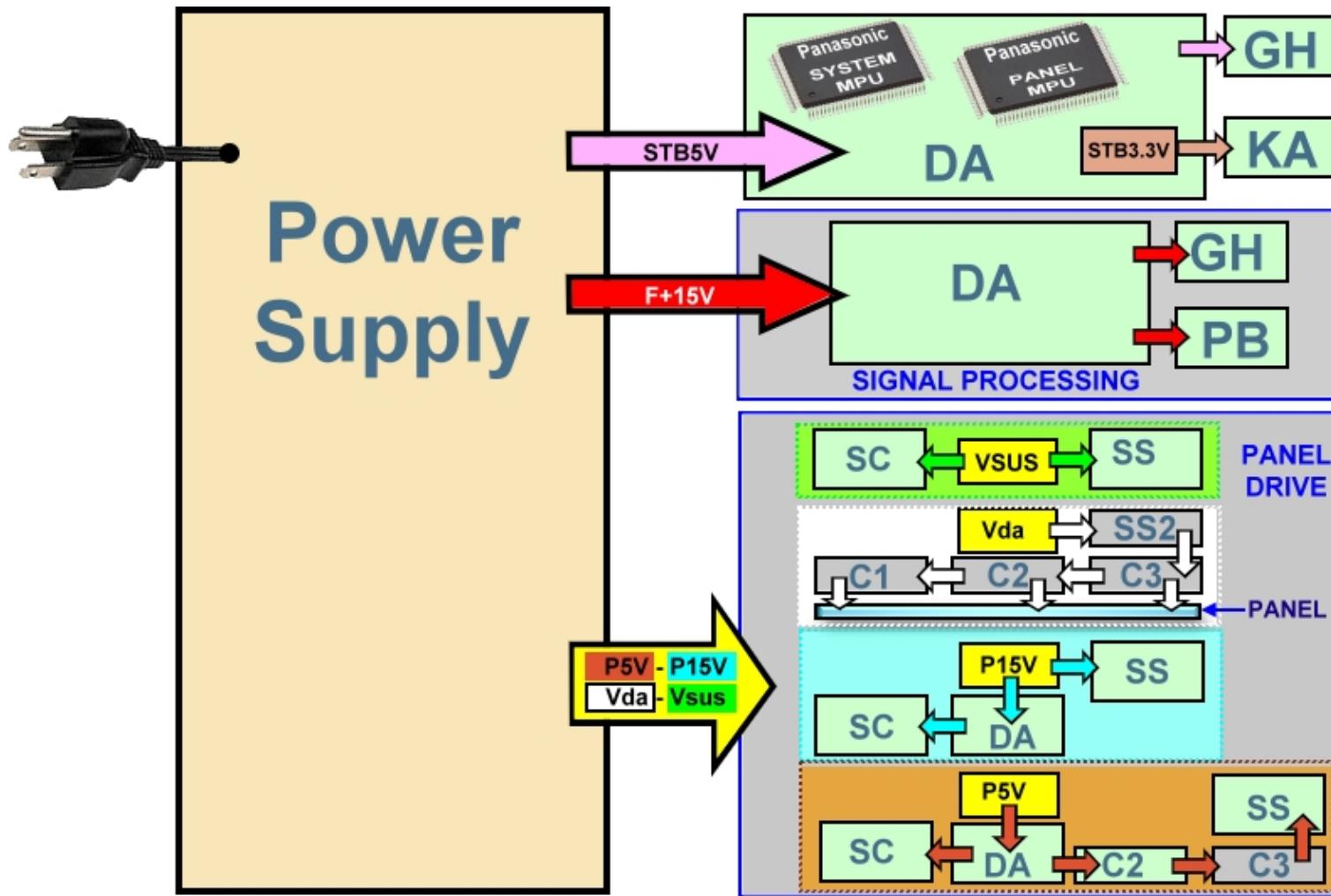
Power Supply Voltages (Display Unit)



The power supply outputs STB5V, F+15V, Vsus, Vda, P15V, and P5V. These voltages are necessary to drive the different circuits in the TV.

In order to provide protection to the TV, these voltages are monitored. If any abnormality is detected, the power supply outputs a shutdown voltage (SOS4_PS) to the System CPU to disable the Unit.

Voltages Distribution



Power Supply Voltages Distribution

STB5V

The STB5V is the first voltage generated by the (P-Multi) power supply.

This voltage is used to activate the System and the Panel microprocessors in the DA board.

STB5V is also used by the GH board (HDMI IN Board) and the KA board (IR Remote Receiver).

F+15V

The F+15V is the second voltage generated by the (P-Multi) power supply.

This voltage is the source of a DC to DC converter in the DA board which outputs SUB voltages.

The SUB voltages are used to energize the signal processing section of the DA board.

F+15V is also used by the fan control circuit board (PB) and the HDMI board (GH).

Vsus

The Vsus is output when the power is turned on.

This voltage is generated by the (P-Vsus) section of the power supply and is used by the SC and SS boards for scan and sustain drive operation.

Vda

This voltages is generated by the (P-Multi) power supply and is used by the panel drive ICs built into the flex-cable between the panel and the data drive circuit boards (C boards).

P15V

This voltages is generated by the (P-Multi) power supply and is used by the SC and SS boards for scan and sustain drive operation. This voltage is also used by the audio amp. circuit in the DA board.

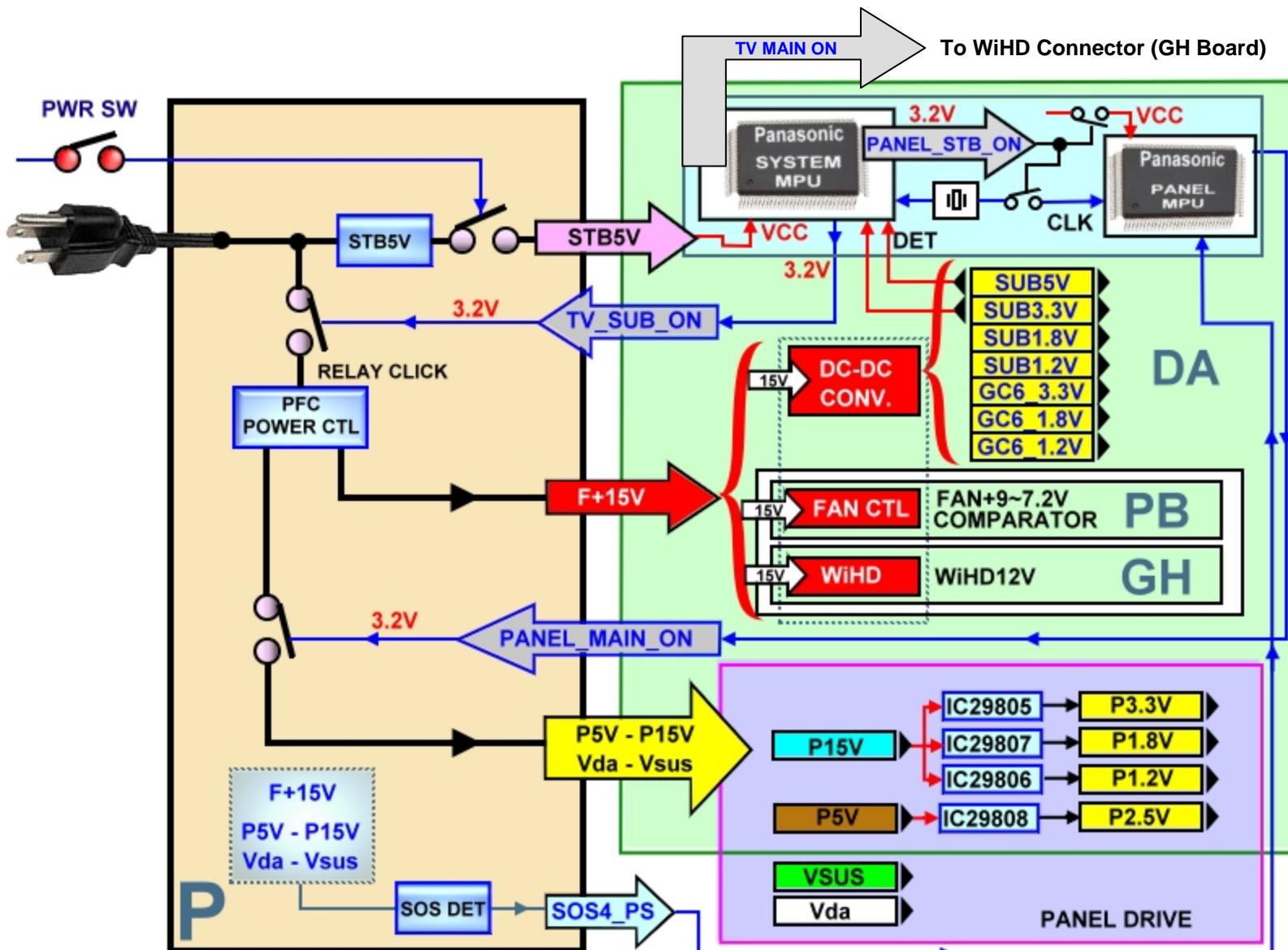
3.3V derived from the P15V is used by the panel drive ICs.

P5V

The P5V is generated by the (P-Multi) power supply and is used by mostly all the boards involved in panel drive operation with the exception of the C1 board.

Microprocessors Commands

TV SUB ON (F-STBY-ON), PANEL-STB-ON, and PANEL MAIN ON



Microprocessors Commands

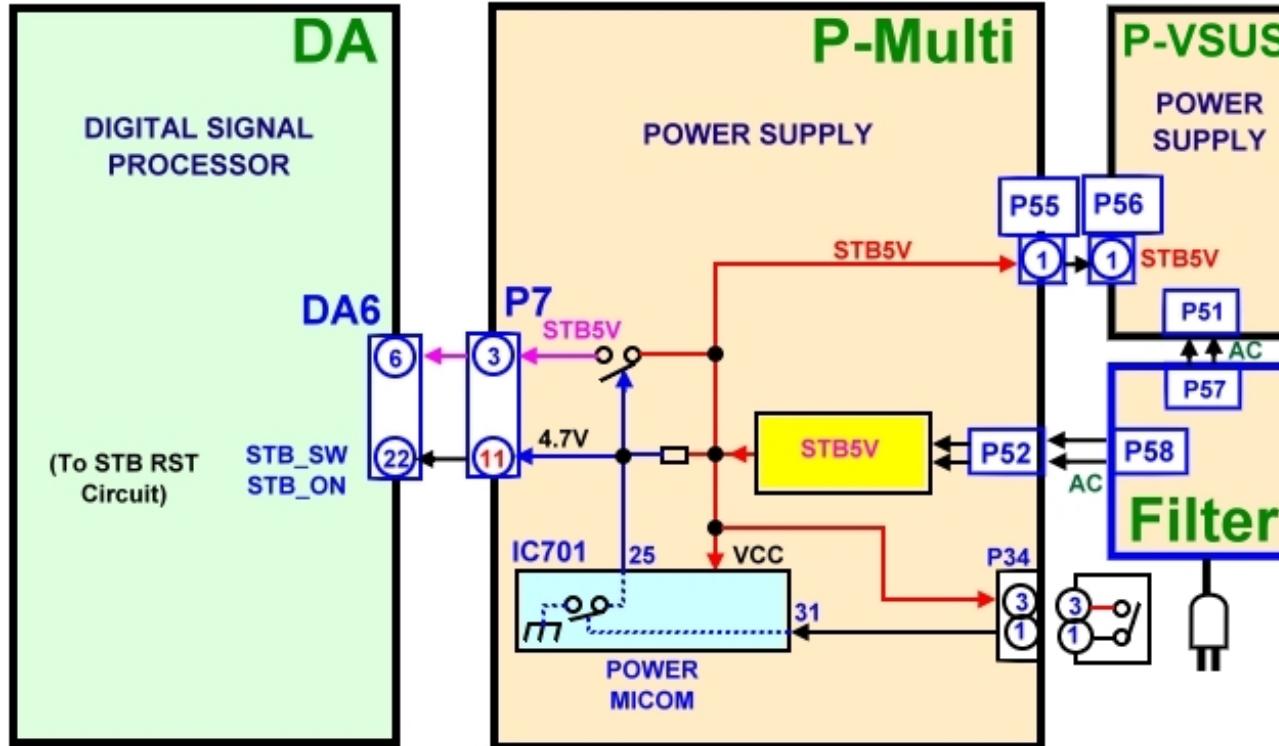
TV SUB ON (F-STBY-ON), PANEL-STB-ON, and PANEL MAIN ON

The STB5V is generated by the power supply when the TV is connected to the AC line. The STB5V is output from the power supply when the Main switch on the TV is set to the On position.

- The **power switch** is used to allow the power supply to output the STB5V to the DA board. The system MPU IC becomes active when STB5V is applied to the DA board. When the MPU is energized, it outputs the “TV Sub On” command to the Power supply.
- The “**TV Sub On**” (3.2V) command is used to turn on the circuit in the power supply that generates the F+15V.
The F+15V is provided to the DA to generate the Sub-voltages used by the signal process circuit.
When the output of the Sub-voltages is confirmed by the system MPU, it outputs the “Panel STB On” command.
- The “**Panel STB On**” (3.2V) command is used to energize the panel MPU IC.
When the panel MPU is energized, it outputs the “Panel Main On” command.
- The “**Panel Main On**” (3.2V) command is applied to the power supply to turn on the circuits that generate the Vsus, Vda, P15V, and P5V.

Note: The “**TV-MAIN-ON**” command applies to wireless connection only. It allows 12V to be output to the wireless receiver module through the WiHD cable.

Standby (Display's Main Switch Off)



When the TV is plugged in, AC is provided to the “P-MULTI and P-VSUS” boards.

AC is applied to the standby circuit in the “P-MULTI” power supply via connector P52 to produce STB5V. STB5V is connected to pin 1 of connector P55 on the “P-VSUS” power supply.

When the Main power switch is off, there's no STB5V provided to the DA board.

The STB5V is provided to the A board via connectors P7 (Pin 3) when the Main switch is turned on.

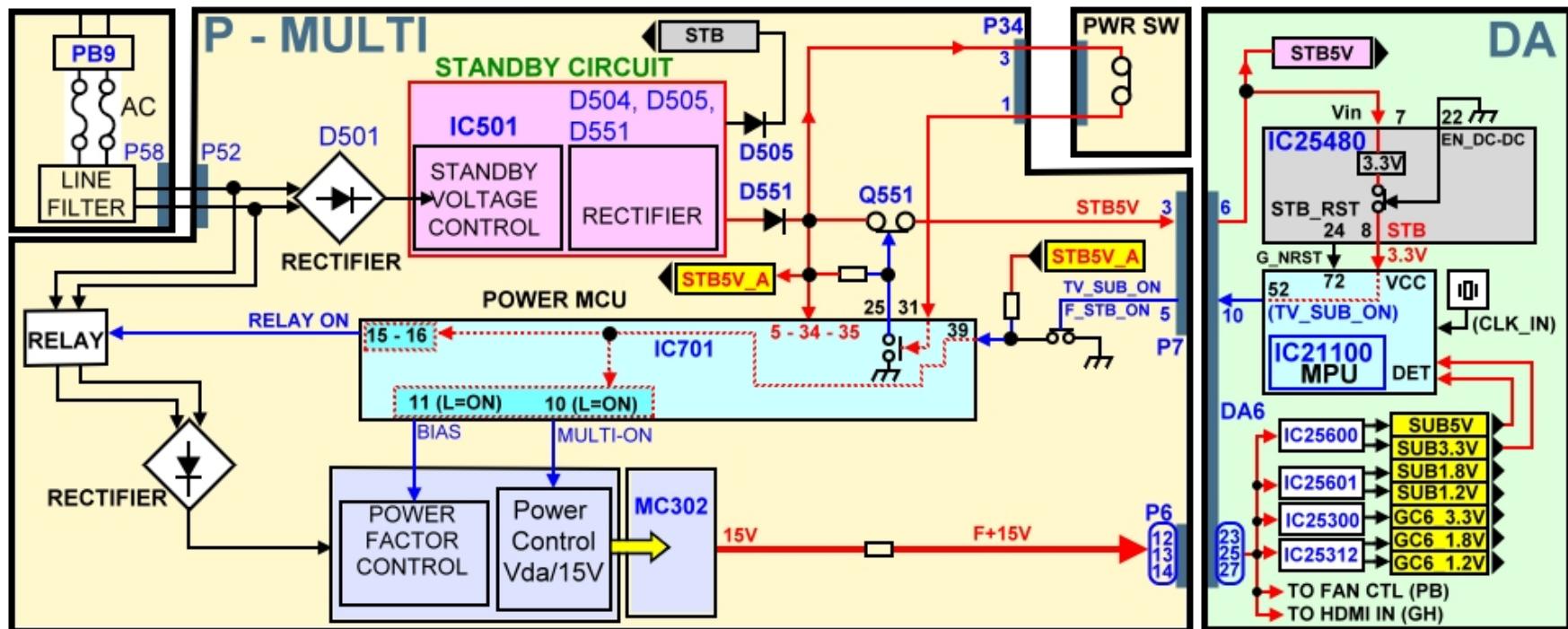
The STB5V from pin 3 of connector P7 is connected to pin 6 of connector A6.

Signal Process Start-up Circuit

F+15V is the only voltage needed from the power supply to activate the signal process circuit.

F+15V is the source of a DC-DC converter circuit in the DA board which output supplies all the different circuits involved in the processing of the signal.

Note: Turning on the Display's Main power switch, turns on the Tuner Box. Turning it off does not turn off the Tuner Box. (This is true for wired or wireless connection).



Signal Process Start-up Circuit

The power MPU IC701 on the P-Multi board receives STB5V when the unit is plugged in to the AC line.

When the display's main switch is turned on, the voltage at pin 25 of the power MPU (IC701) changes from 4.7V to 0V. This turns on Q551 and STB5V is output to the A board via connectors P7 (Pin 3). The STB5V from pin 3 of connector P7 is connected to pin 6 of connector A6.

STB5V is applied to a 3.3V regulator (IC25480) to power the Main MPU (IC21100) on the DA board. This energizes the microprocessor (CPU) and gets it ready for program execution.

The 3.3V from the voltage regulator besides being applied to the CPU, is also applied to the power LED on the K board through pin 4 of connector DA1/KA1.(Not shown here).

If the STB5V is missing, the TV is dead (No power).

The system MPU (IC21100) outputs a 3.2V command (TV-Sub-On/F-STB-On) to the power supply through pin 5 of connector P7.

This command forces pin 39 of IC701 on the power supply to go low. This in term forces pins 15, 16, 10, and 11 to go low.

When pins 15 and 16 go low, the In-rush and Main relays are triggered allowing AC to be applied to a bridge rectifier.

The DC voltage from the rectifier is applied to the Vda/P15V Power Factor Control circuit.

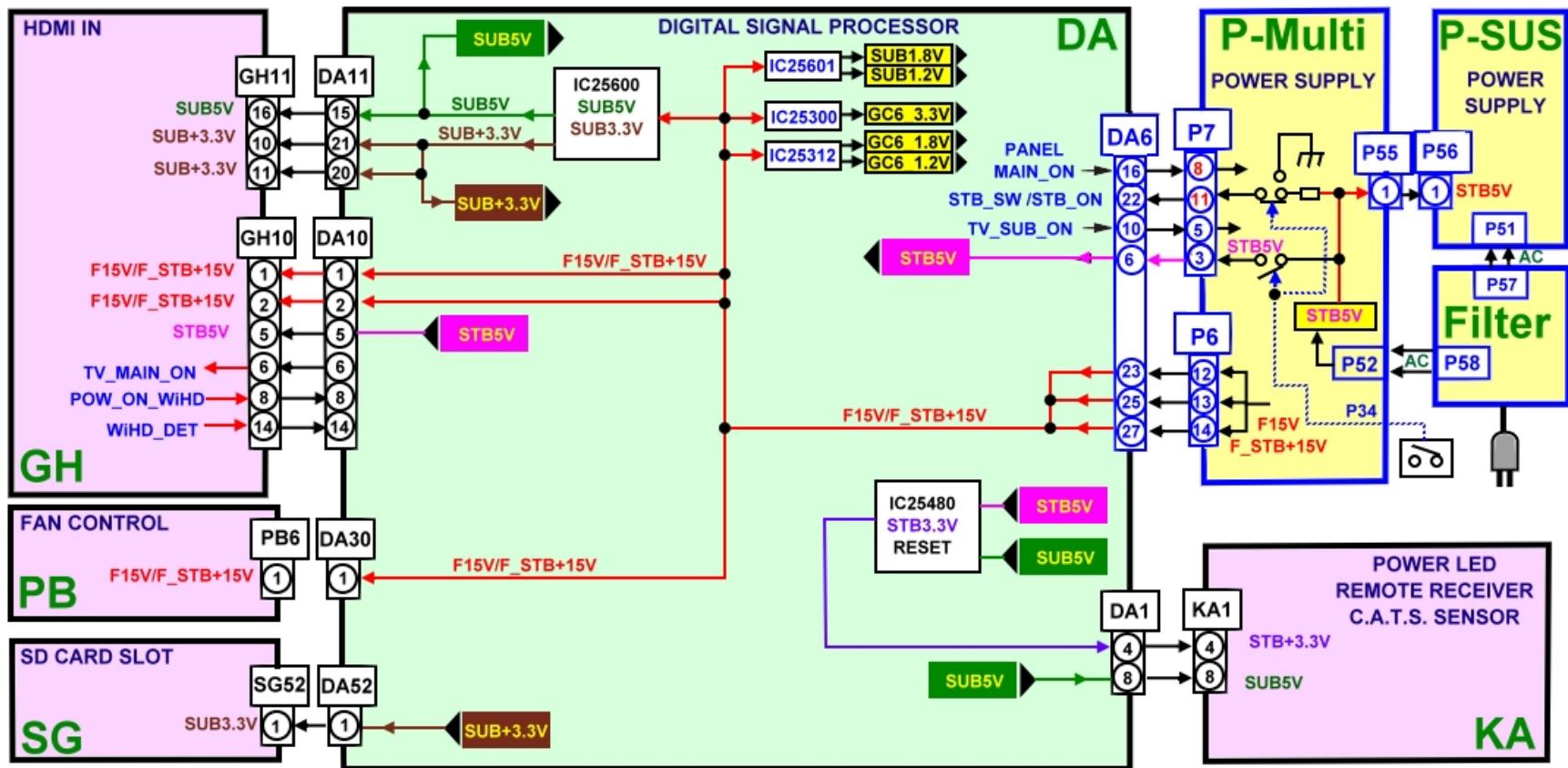
The changes on pins 10 and 11 turn on the Power Factor Control circuit and the Vda/P15V Control circuit and F+15V is output from MC302.

The F+15V is connected to pins 23, 25, and 27 of connector DA6 on the DA board.

F+15V is the source of a DC-DC converter circuit in the DA board composed of IC25600, IC25601, IC25300, and IC25312. This circuit outputs SUB5V, SUB3.3V, SUB1.8V, SUB1.2V, GC6-3.3V, GC6-1.8V, GC6-1.2V respectively.

SUB5V and SUB3.3V are connected to the MPU (IC21100) for voltage output confirmation.

F+15V/SUB-Voltages Distribution



F+15V/SUB-Voltages Distribution

The F+15V from the power supply is connected to pins 23, 25, and 27 of connector A6 on the A board

The F+15V from the P board is the source that supplies the DC-DC converter circuit (IC25600, IC25601, IC25300, and IC25312). This circuit outputs SUB5V, SUB3.3V, SUB1.8V, SUB1.2V, GC6-3.3V, GC6-1.8V, GC6-1.2V respectively.

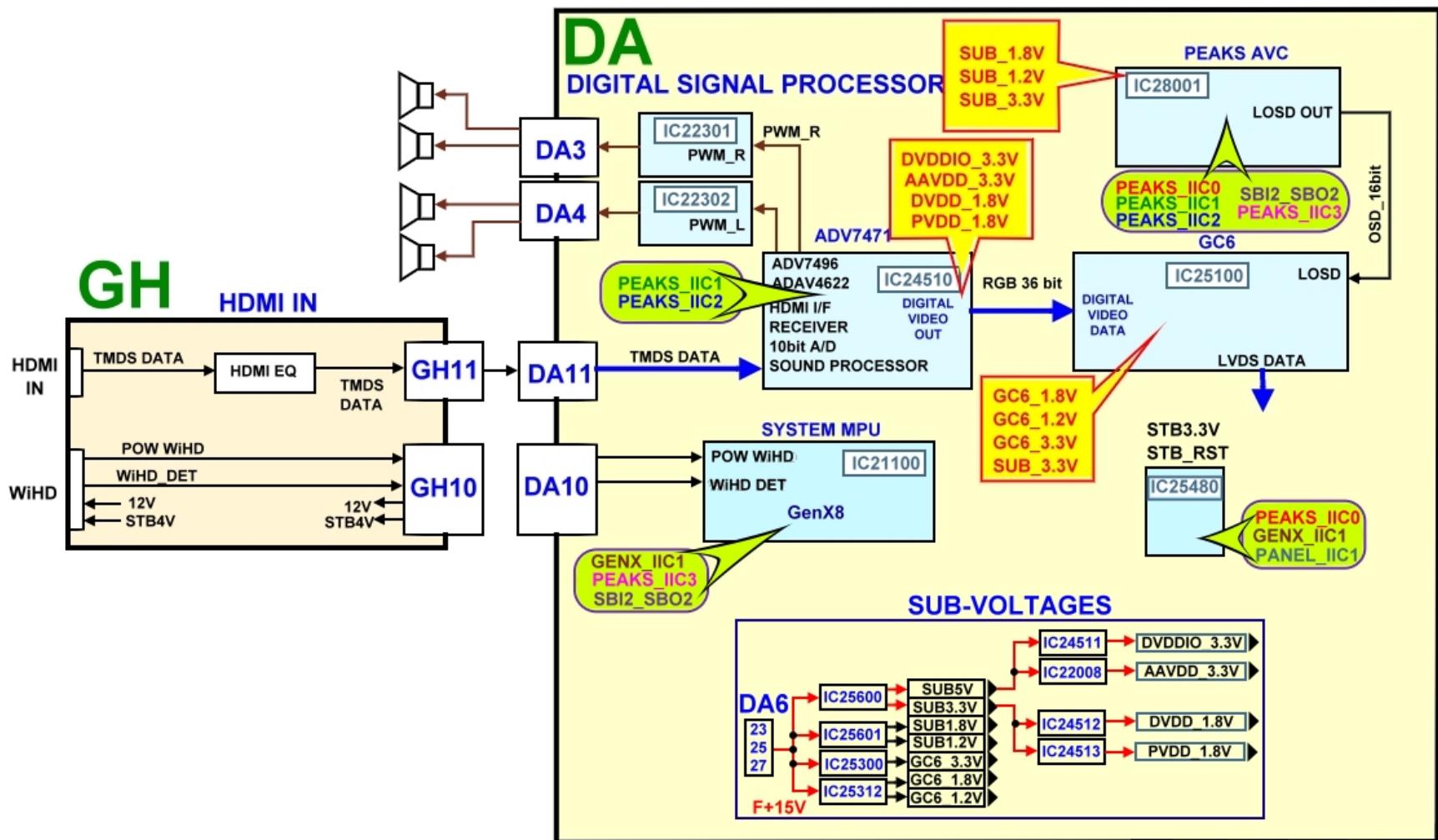
These voltages are normally used in the DA board. Only the SUB5V and the SUB3.3V are used outside the DA board.

The SUB5 is used by the HDMI board (GH) and the KA board.

The SUB3.3V is used by the HDMI board (GH) and the SD Card Slot board (SG)

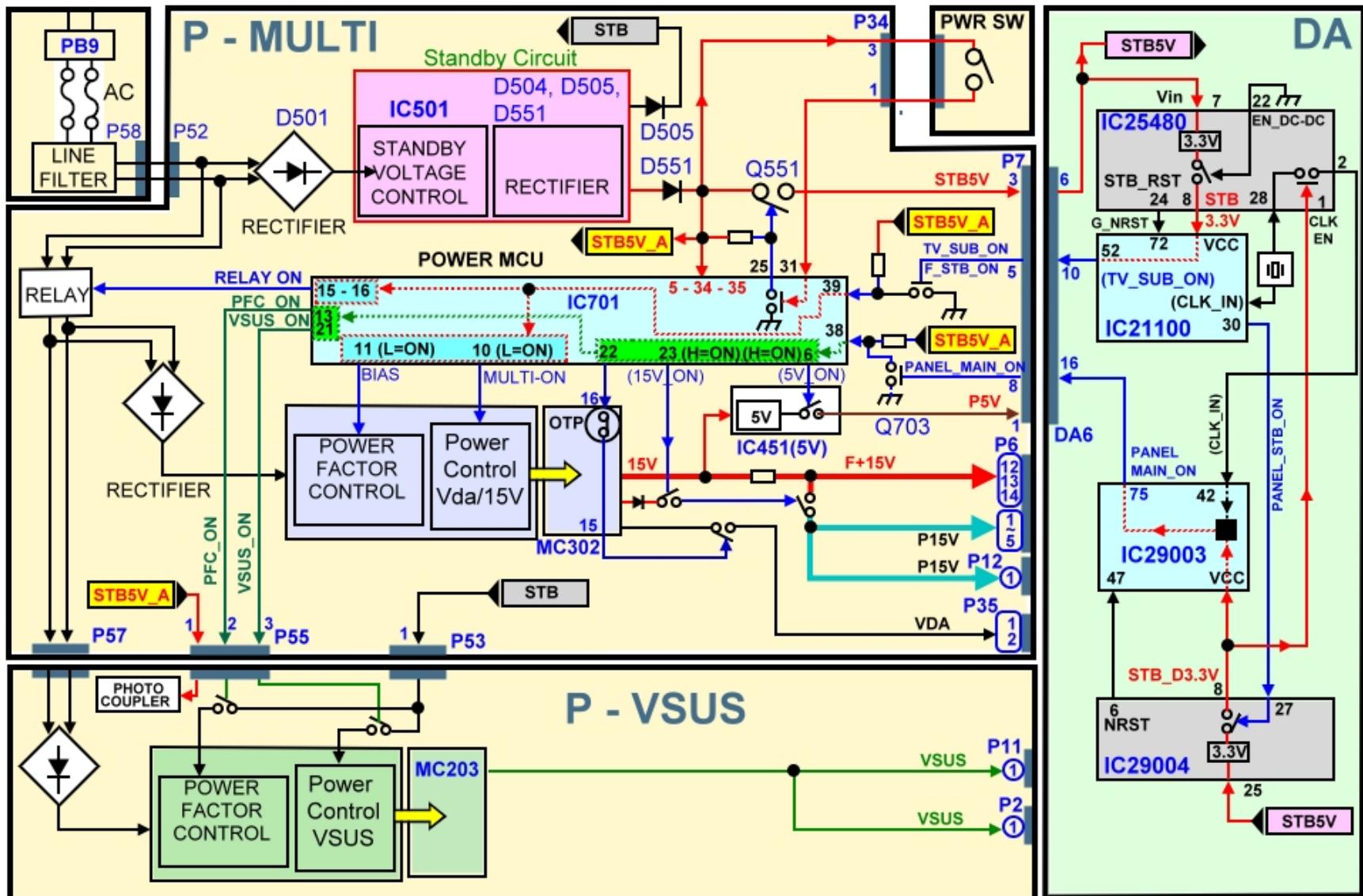
A 10 blinks code from the power LED indicates abnormalities in any of these voltages including the F+15V.

Sub-voltages Applied to Signal Process Circuit



The signal processing circuit becomes energized when the sub-voltages are applied to IC24510, IC2800, and IC25100.

Panel Drive Start-up Circuit



Panel Drive Start-up Circuit

After the confirmation of the voltages generated as the result of the 3.2V “TV-SUB-ON” command from pin 52, the System MPU IC21100 outputs the “PANEL-STB-ON” command.

The 3.2V “PANEL-STB-ON” command from pin 30 of IC21100 is applied to the control pin (27) of IC29004. This turns on the regulator section of this IC to output STB-D3.3V on pin 8.

Note: **STB3.3V** and **STB-D3.3V** are different voltages. STB3.3V is generated by IC25480 and STB-D3.3V is generated by IC29004

The STB-D3.3V is used as VCC for the panel MPU (IC29003) and is also used to switch the clock signal in IC25480.

The panel MPU (IC29003) starts its program execution when it receives the STB_D3.3V and the crystal clock signal (Pin 42). When this happens, the 3.2V “PANEL-MAIN-ON” command is output on pin 75.

The 3.2V “PANEL-MAIN-ON” command is applied to a switching circuit in the power supply. This forces pin 38 of IC701 low to turn on the circuits that generate Vsus, Vda, P15V, and P5V.

When pin 38 goes low, pins 13, 21, and 22 also go low while pins 6 and 23 go high.

The power factor control circuit and the Vda/P15V generating circuit had already been turned on previously when the “TV-SUB-ON” command was provided to the power supply.

The low command from pin 22 of IC701 is connected to an “Over-temperature-protector” inside MC302 before it is connected to a switching circuit to generate the Vda.

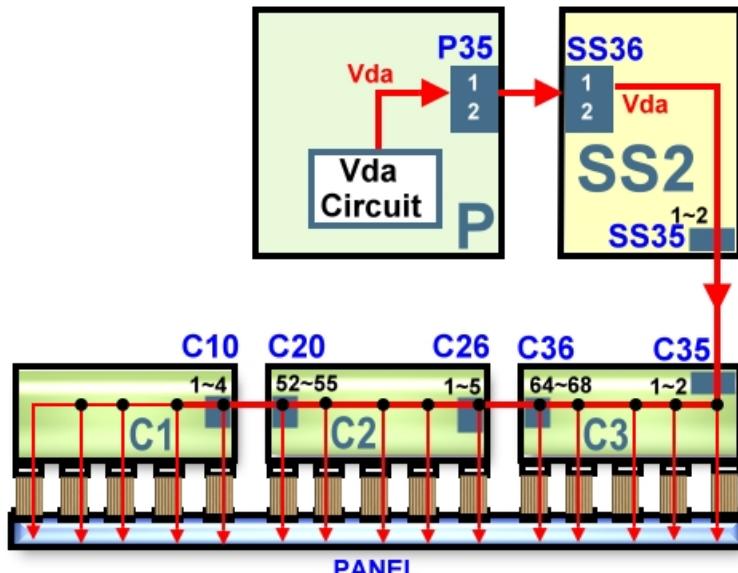
The high from pin 23 turns on a switching circuit to generate the P15V.

The high from pin 6 turns on a switching circuit to generate the P5V. This voltage is derived from the 15V.

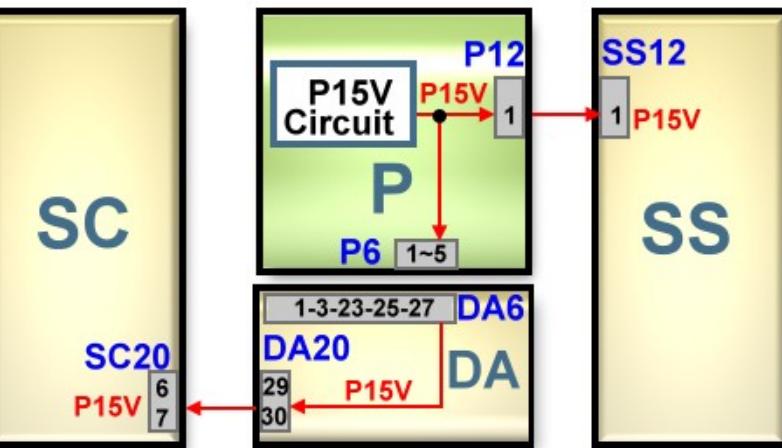
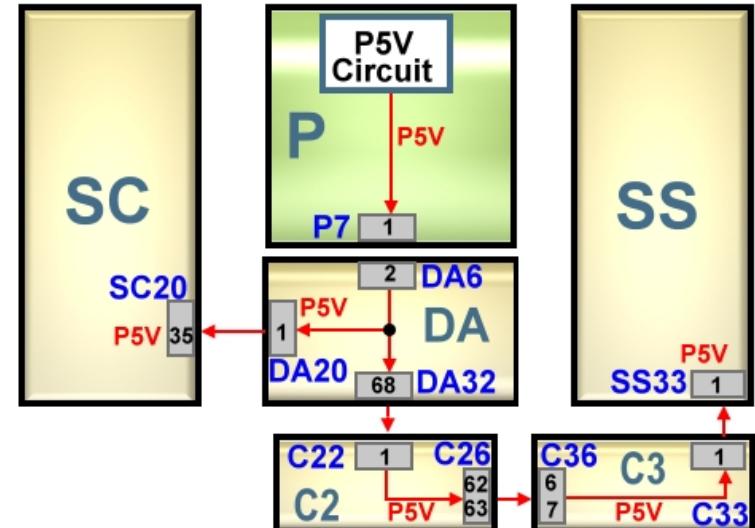
The power factor control circuit and the Vsus generating circuit in the P-Vsus section of the power supply are turned on when pins 13 and 21 go low. This allow for Vsus to be generated.

Panel Drive Voltages Distribution

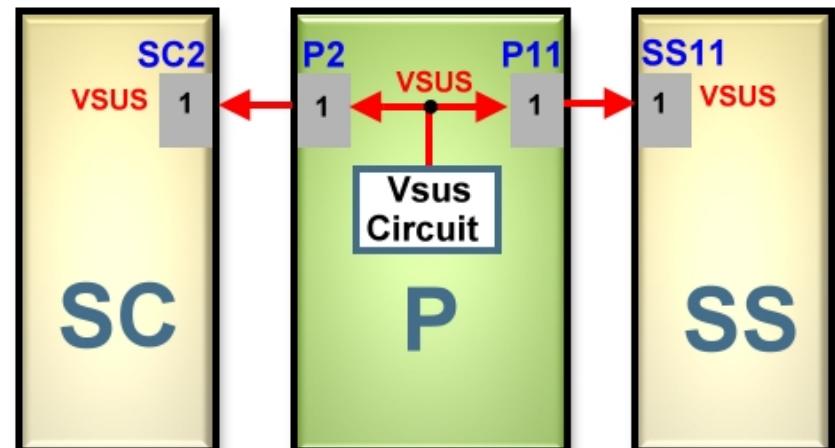
Vda Distribution



P5V Distribution

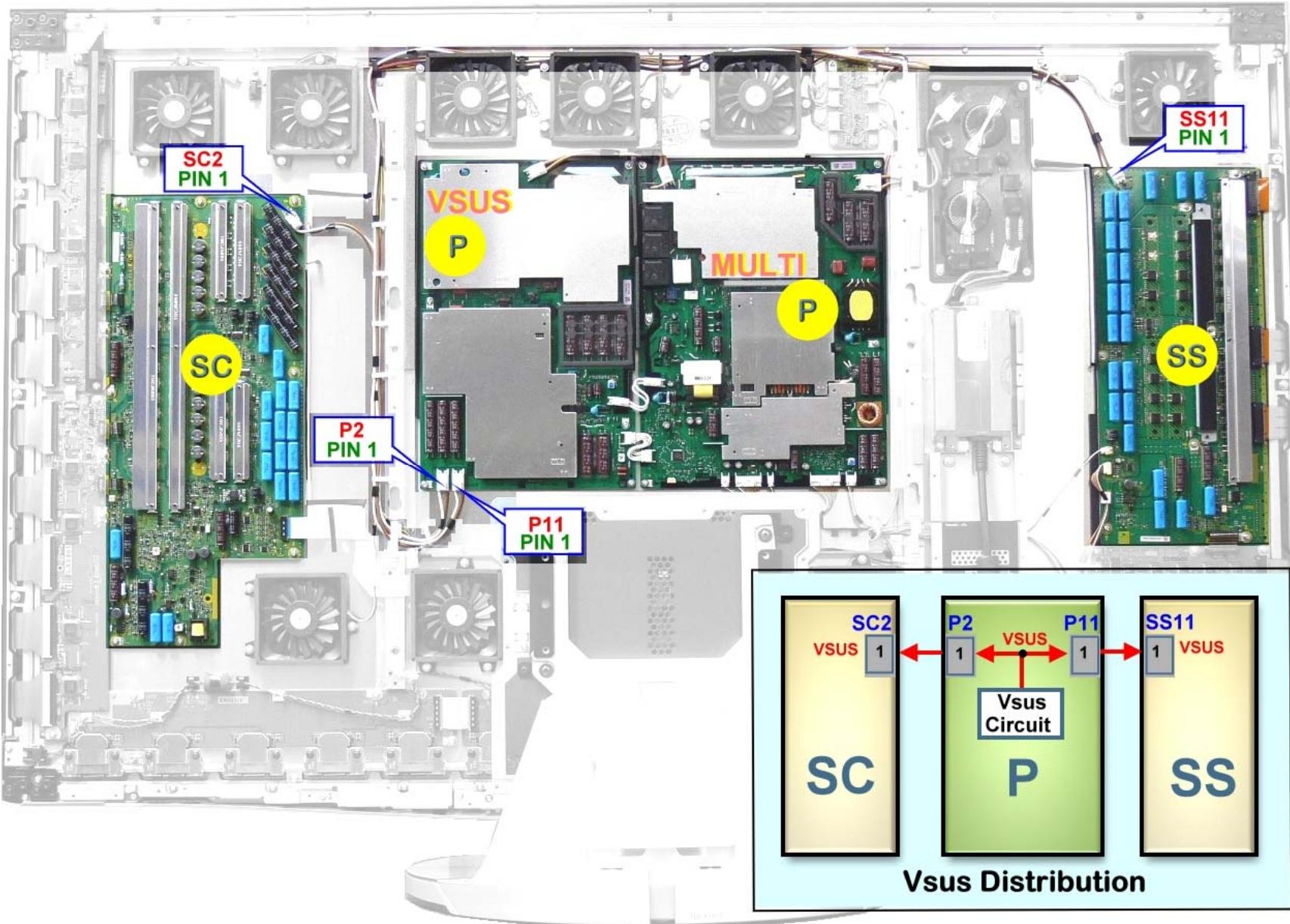


P15V Distribution

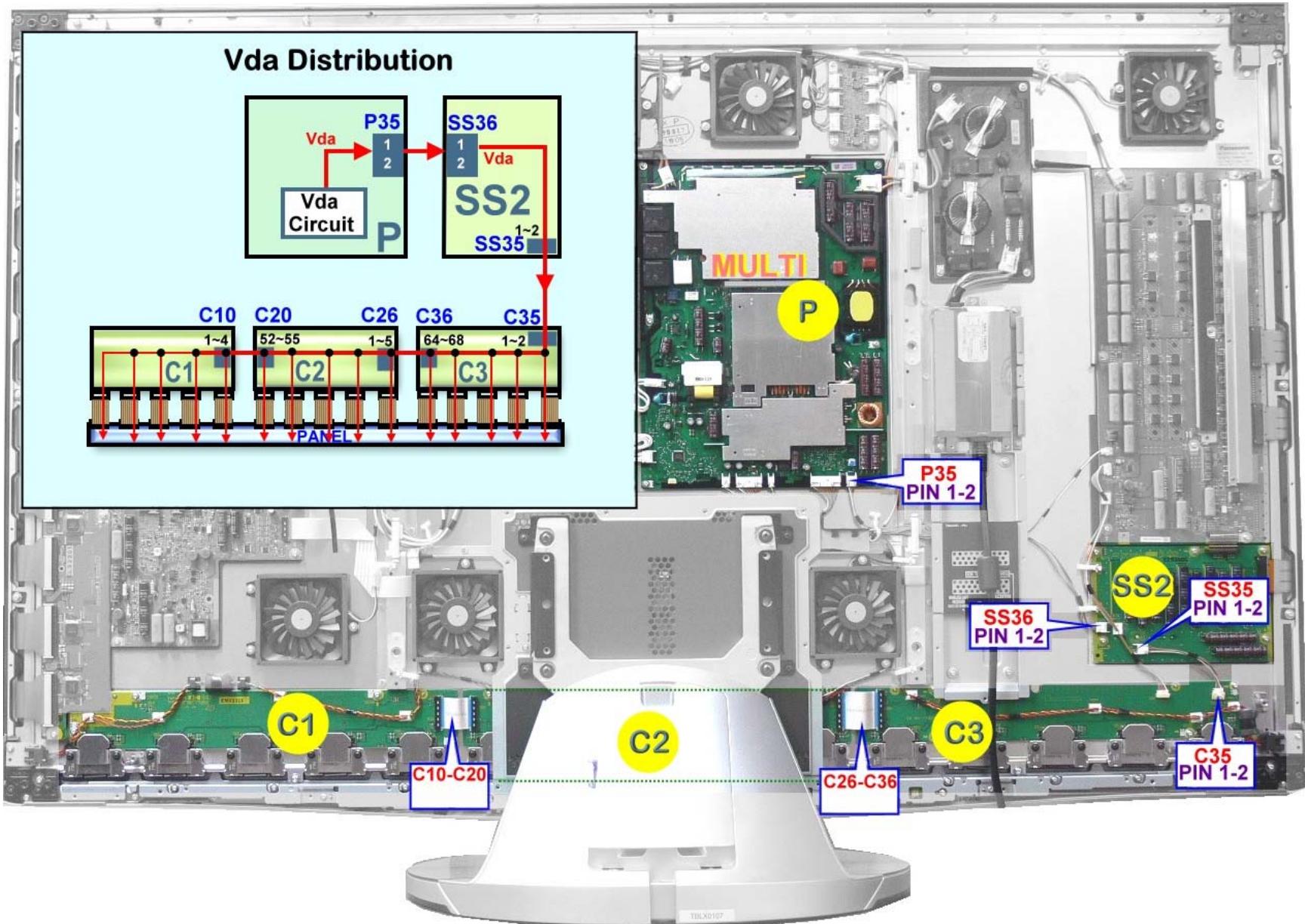


Vsus Distribution

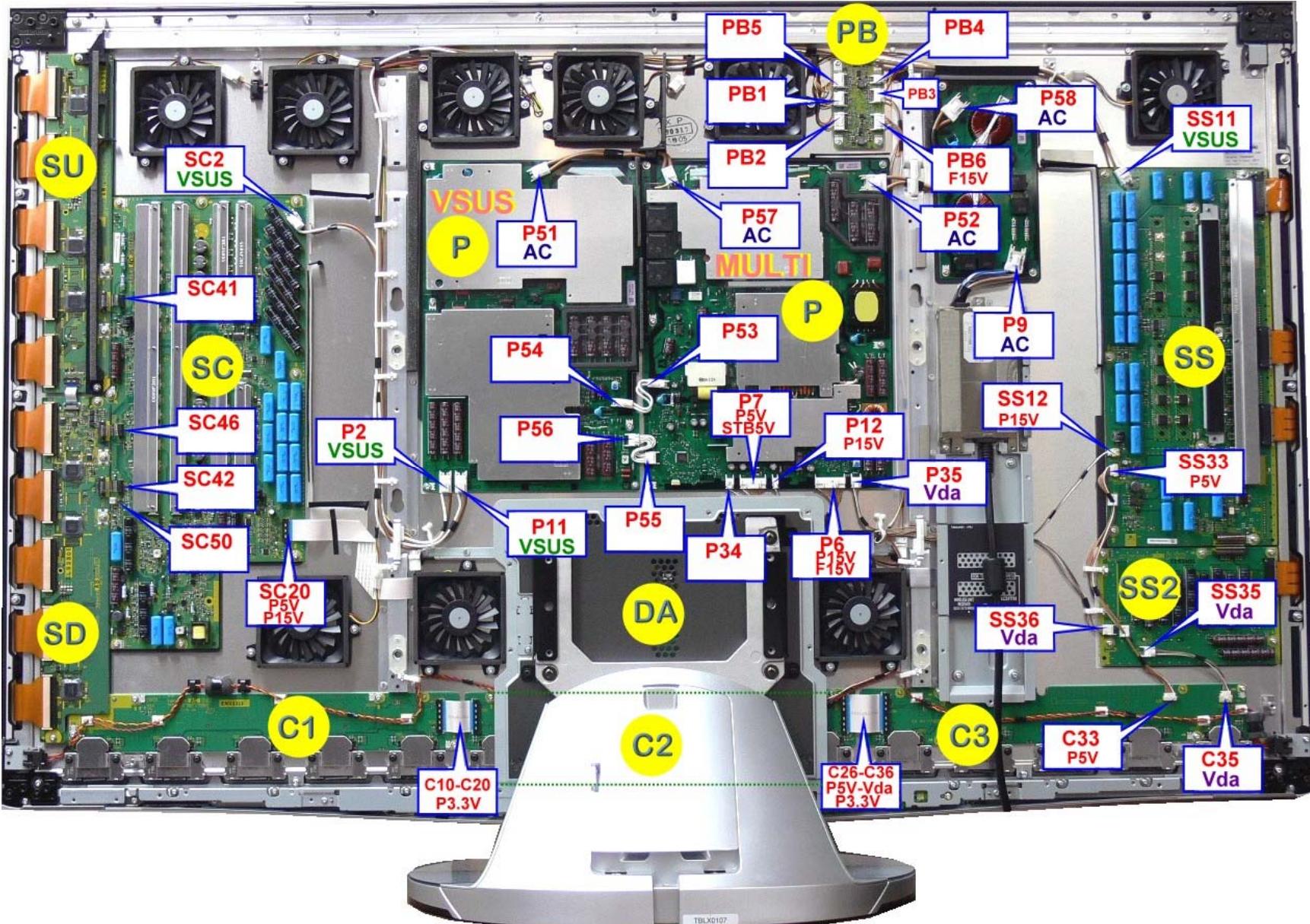
Vsus Distribution



Vda Distribution



Display Unit Connectors Location



SOS Detect (Shutdown)

When an abnormality occurs in the unit, the “SOS Detect” circuit is triggered and the TV shuts down. The power LED on the front panel will flash a pattern indicating the circuit that has failed.

Power LED Response to Shutdown Condition

Number of Blanks	Blinking Time	Items Monitored	Blinking LED		Suspected Board	
			Tuner Box	Display Unit	Tuner Box	Display Unit
1		No particular check point				-
		Panel Status				-
		STB 5V Sense Time out				DA -Board
2		15 V SOS				P-Board DA-Board SC-Board SS-Board
3		3.3 V SOS				DA -Board PANEL C1-C2-C3
4		Power SOS				DA-Board P-Board
5		5V SOS				P-Board DA- Board SC-Board SS-Board C2-C3
6		Driver SOS1 (SC Energy recovery circuit)				SC-Board DA-Board
7		Driver SOS2 (SC floating voltage area)				SU-Board SD-Board SC-Board DA-Board
8		Driver SOS3 (SS FPC/DET) (SS Energy recovery circuit)				SS-Board SS2-Board PANEL
9		Communication Error between Panel-MPU and SYS-MPU				DA -Board

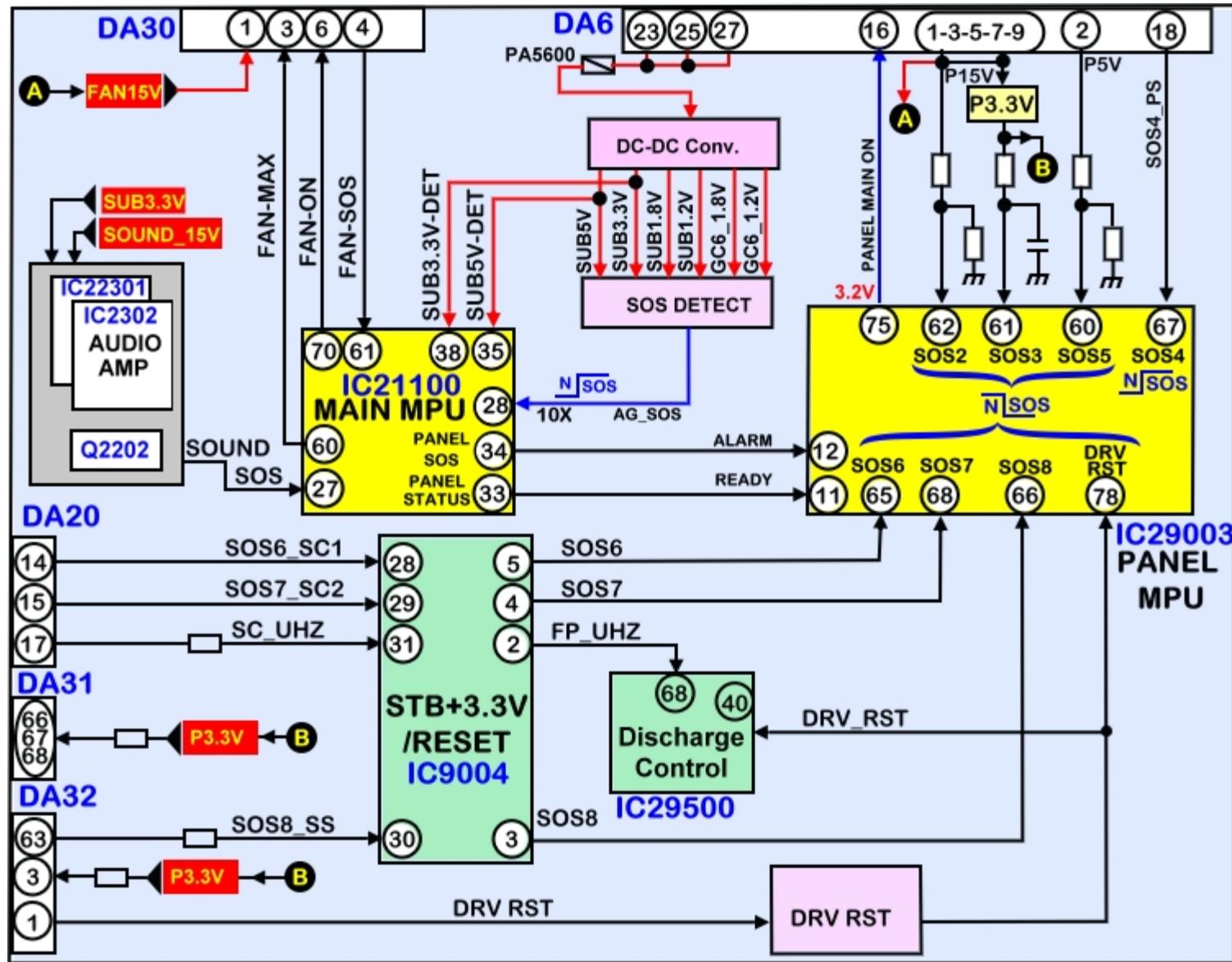
Power LED Response to Shutdown Condition

Number of Blinks	Blinking Time	Items Monitored	Blinking LED		Suspected Board	
			Tuner Box	Display Unit	Tuner Box	Display Unit
10	ON OFF	Sub 9V/5V/3.3V SOS Tuner Power SOS DA-Board Power SOS	●	●	A -Board	.
11	ON OFF	Fan SOS	●	●	A -Board Fan	D A - Board Fans P-Board
12	ON OFF	Sound SOS	●	●		D A - Board
14	ON OFF	Audio PWM SOS	●	●		D A - Board

Note: Replace the Tuner Box for shutdown problems caused by the Tuner Box. (10 or 11 Blinks)



Display Unit SOS Detect Block Diagram



Panel MPU SOS Detect

- Protection circuits are incorporated in the unit to prevent the failure of a single circuit or component from creating catastrophic damage.
- A shutdown condition occurs when there is an over voltage, a short or a drop in any of the voltage lines. Also the shutdown circuit is triggered when the fans are drawing more current than normal or are not connected.
- Normally the Panel CPU and the System CPU of the DA board detect when a shutdown condition has been triggered.
- When an abnormality has occurred, the unit's protection circuit operates and the TV is reset to the standby mode. At this time, the defective block can be identified by the number of blinks of the POWER LED on the front of the unit.
- The Panel MPU IC29003 of the DA board detects conditions that make the power LED blinks 1, 2, 3, 4, 5, 6, 7, 8, or 9 times.
- The Main MPU IC21100 of the DA board detects conditions that make the power LED blinks 10, 11, 12, 13, and 14 times.
- The number of times that the POWER LED blinks indicates the areas where a problem is suspected.

- **1 Blink SOS:** Communication error between IC21100 and IC29003.
- **2 Blinks SOS:** Pin 62 of the CPU IC29003 monitors the 15V line. During normal operation pin 62 is kept high. If the 15V line is missing or shorted, a low is provided to pin 62. As a result, the unit shuts down and the power LED blinks 2 times.
- **3 Blinks SOS:** The P3.3V is monitored by IC29003. If the 3.3V is not present at pin 61, the CPU (IC29003) shuts down the unit. The power LED blinks 3 times.

Panel MPU SOS Detect (Continue)

4 Blinks SOS: When an over voltage condition of the voltage lines from the power supply occurs, pin 18 of connector A6 goes high. This high is provided to pin 67 of IC29003 of the DA board triggering the “POWER SOS” circuit. When this happens, the TV shuts down and the power LED blinks 4 times. Primarily the P board causes 4 blinks, followed by the DA board.

5 Blinks SOS: Pin 60 of the CPU IC29003 monitors the 5V line. During normal operation, pin 60 is kept high. If the 5V line is missing or shorted, a low is provided to pin 60. As a result, the unit shuts down and the power LED blinks 5 times.

6 Blinks SOS: Pin 65 of the CPU IC29003 monitors the status of the SC board. During normal operation, a low is applied to pin 65. If the SC board becomes defective, a high is provided to pin 65. As a result, the unit shuts down and the power LED blinks 6 times.

7 Blinks SOS: Pin 68 of the CPU IC29003 monitors the status of the SC, SU, SD board. During normal operation, a low is applied to pin 68. If the SC, SU, or SD board becomes defective, a high is provided to pin 68. As a result, the unit shuts down and the power LED blinks 7 times.

8 Blinks SOS: Pin 66 of the MPU IC29003 monitors the status of the SS board. During normal operation, pin 8 of connector SS33 outputs a low to pin 66. If the SS board becomes defective, a high is provided to pin 66. As a result, the unit shuts down and the power LED blinks 8 times.
8 Blinks condition is also caused when the connections between the panel's flex-cables and the sustain board is broken.

System MPU SOS Detect

10 Blinks SOS: IC25600 generates the SUB5V and BUB3.3V, IC25601 generates the SUB1.8V and SUB1.2V, IC25300 generates GC6-3.3V, and IC25312 generates GC6-18V and GC6-1.2V. These voltages are monitored by a SOS detect circuit. Any abnormality on these voltages triggers the shutdown circuit and the MPU shuts down the unit. The power LED blinks 10 times.

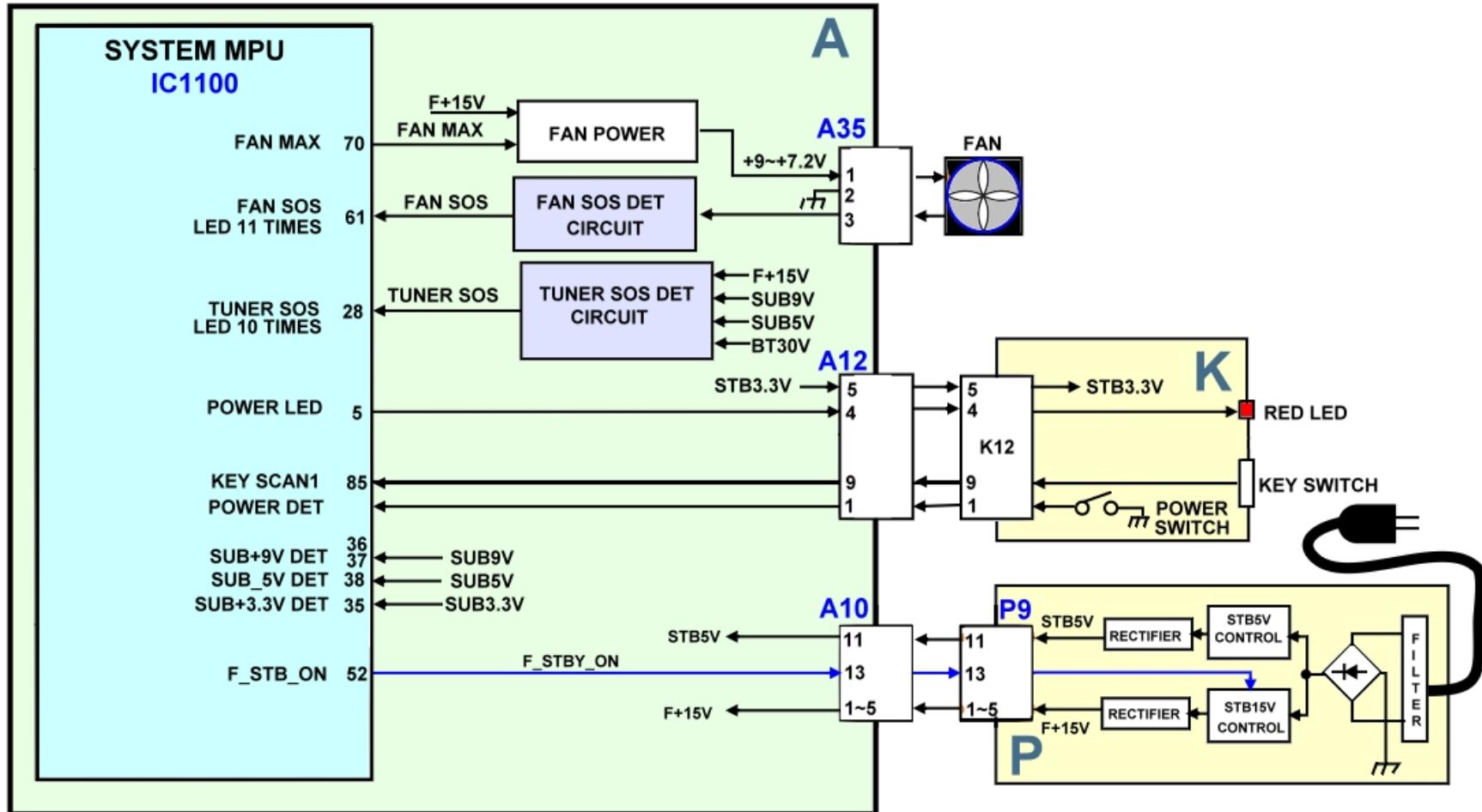
11 Blinks SOS: The ventilation fans are monitored for proper operation. If one of the fans opens or increases resistance, the resulting current change is applied to pin 61 of the main CPU (IC21100). This triggers the Fan SOS and the TV shuts down. The power LED blinks 11 times.

12 Blinks SOS: The operation of the audio power amplifiers IC22301 and IC22302 is monitored. If the audio output circuit develops a short to ground, a high is output to pin 27 of the MPU (IC21100), triggering a SOS condition. The power LED blinks 12 times.

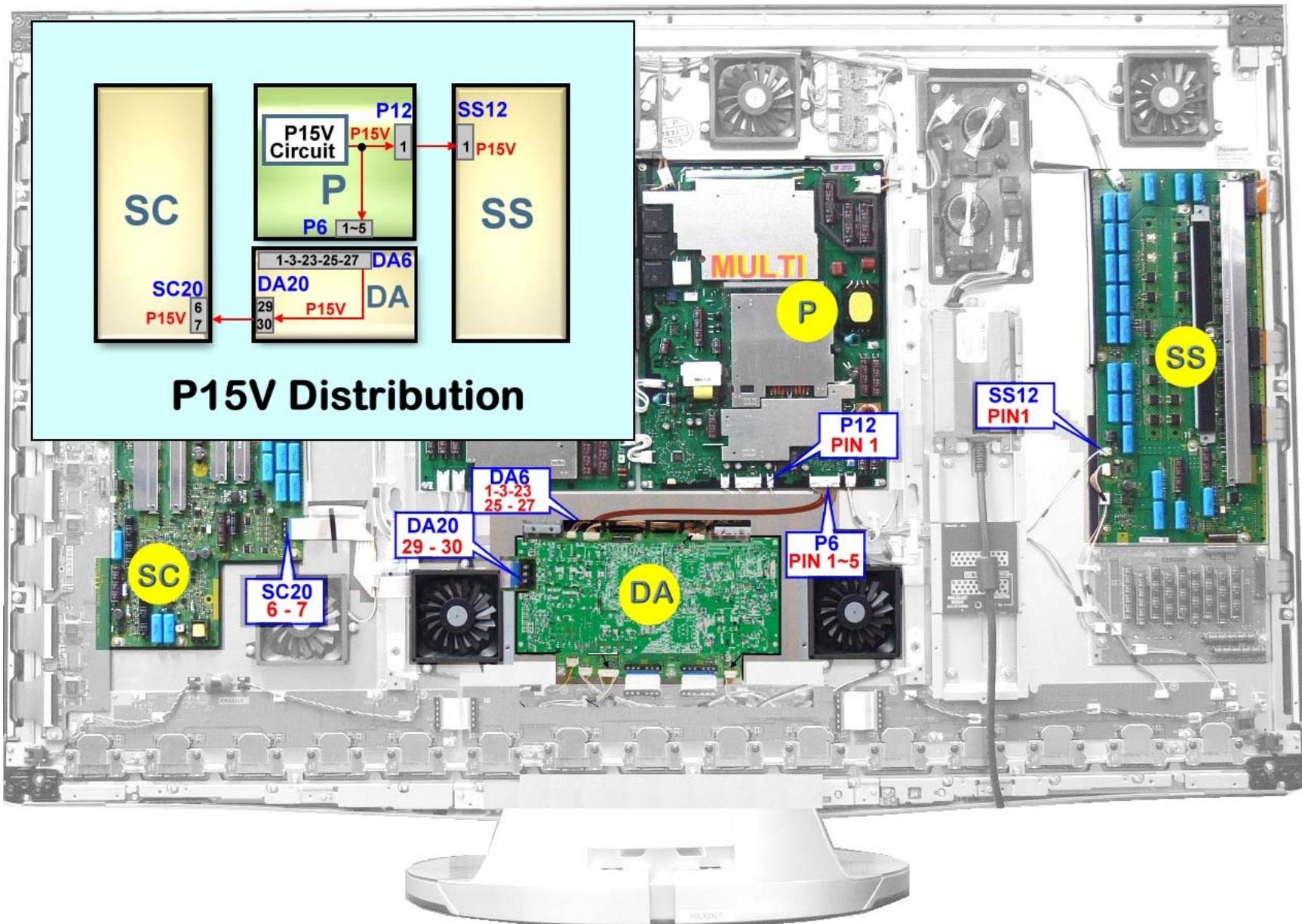
14 Blinks SOS: Audio PWM.

Tuner Box SOS Detect Block Diagram

Note: This block diagram is to be used for reference. Replace the Tuner Box for shutdown problems caused by the Tuner Box. (10 or 11 Blinks)



P15V Distribution



Troubleshooting 2 Blinks Error Code

These 3 conditions can cause the TV to shutdown and the power LED to blink 2 times

1. Missing P15V
2. A short of the P15V
3. Wrong diagnostic by the DA board

When troubleshooting a PDP TV that is shutting down and the power LED blinks 2 times:

Find out if 15V is output at pins 1~5 of connector P6 of the P board. If 15V is present, it's likely that the DA board is defective.

If no voltage is output, determine if this is caused by the P board or the boards using the P15V.

The boards connected to the P15V can only affect the P15V if there is a short circuit drawing excessive current.

To check for a short circuit, measure the resistance between any of the pins 1~5 of connector P6 and ground (Chassis). If P15V is shorted, find out if the short is coming from the P board or if it's coming from any of the other boards that the 15V volt is connected to.

If the P board is OK, disconnect the connectors providing the P15V to all these boards while measuring resistance between any of the pins 1~5 of connector P6 and ground.

The defective board is found when the connector that provides the P15V to that board is removed and the short circuit is no-longer present.

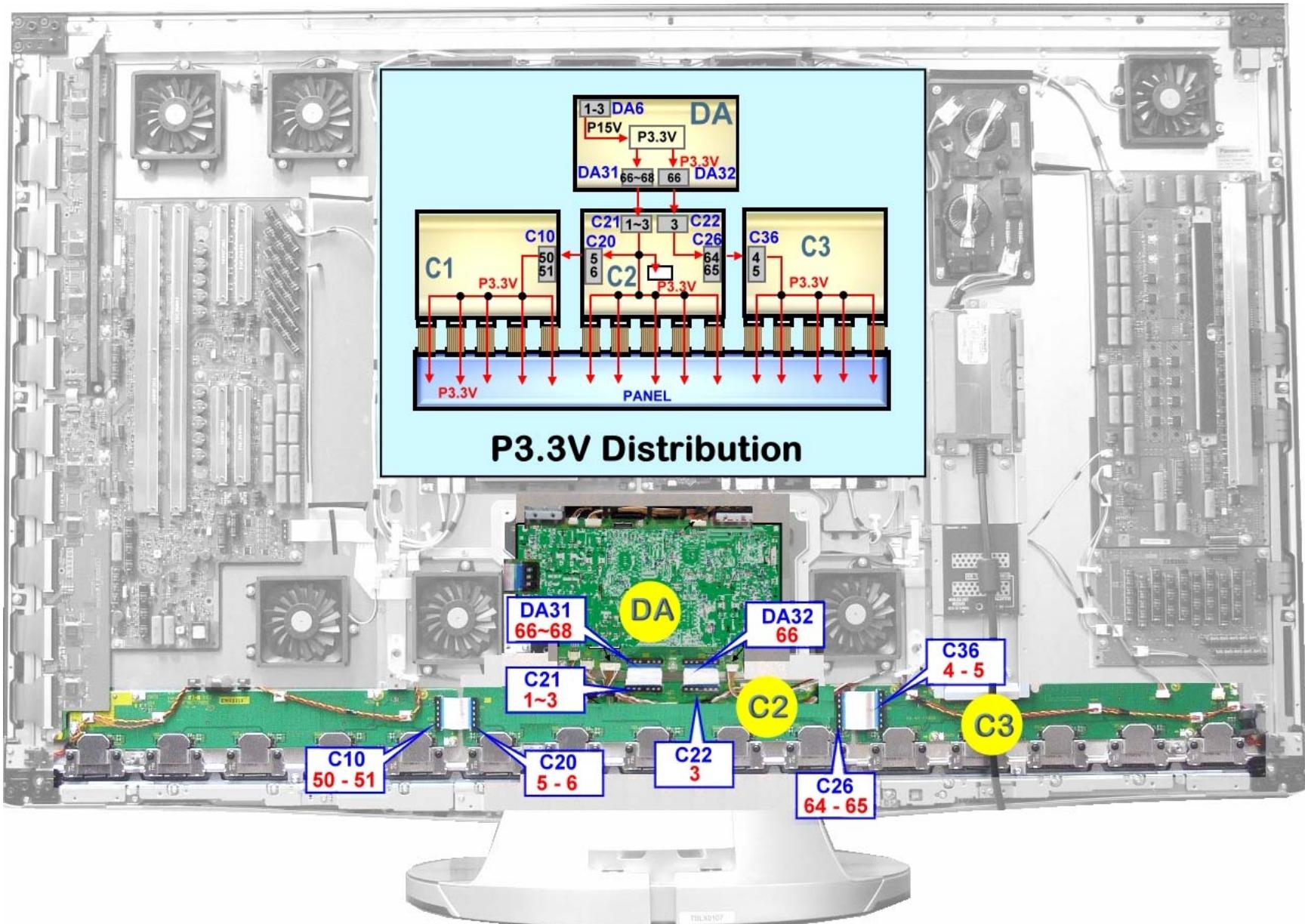
The boards that can possibly cause the TV to shutdown with 2 blinks of the power LED are:

SC – 80% Probability

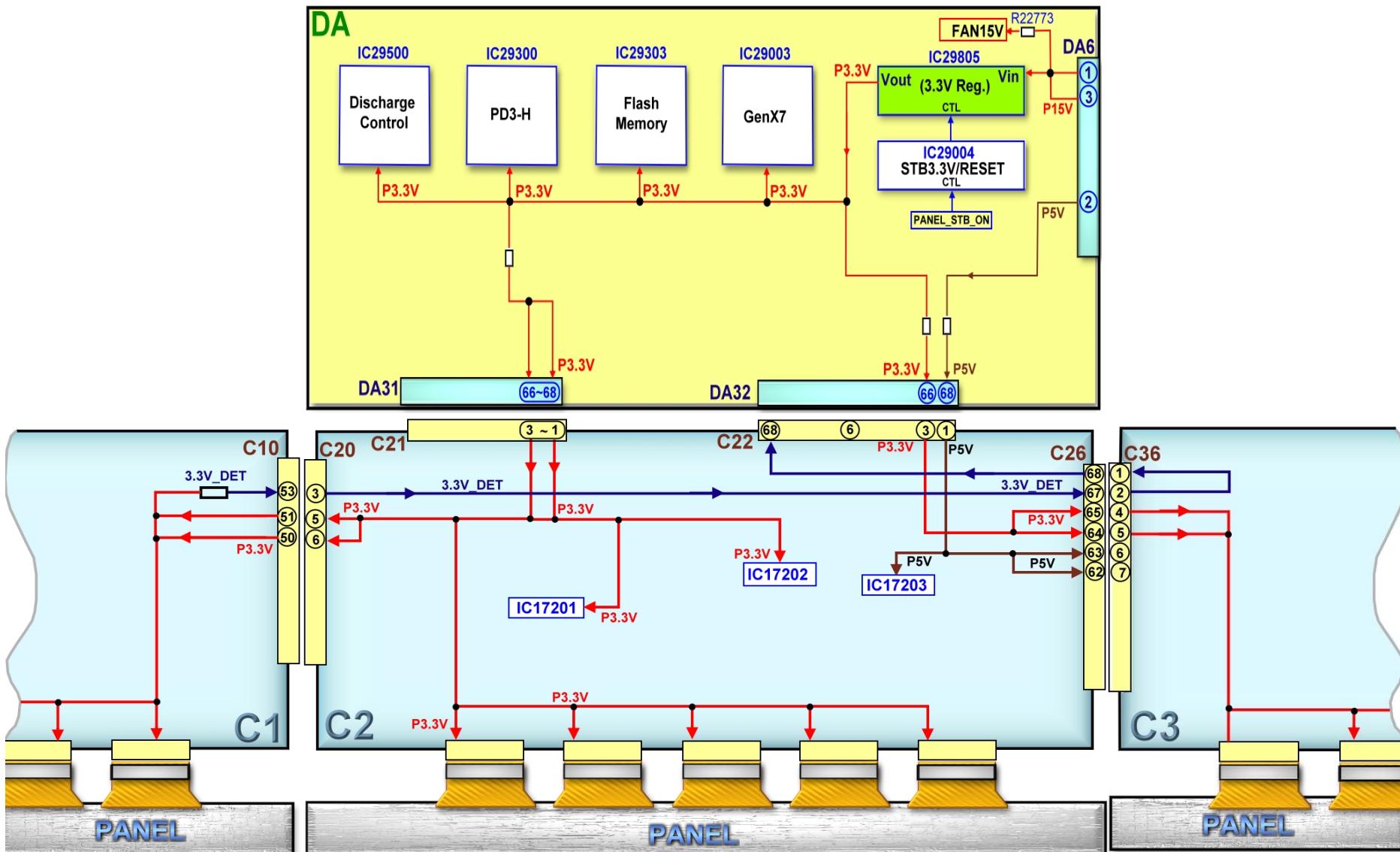
P and **DA** – 50% Probability

SS – 20% Probability

P3.3V Distribution



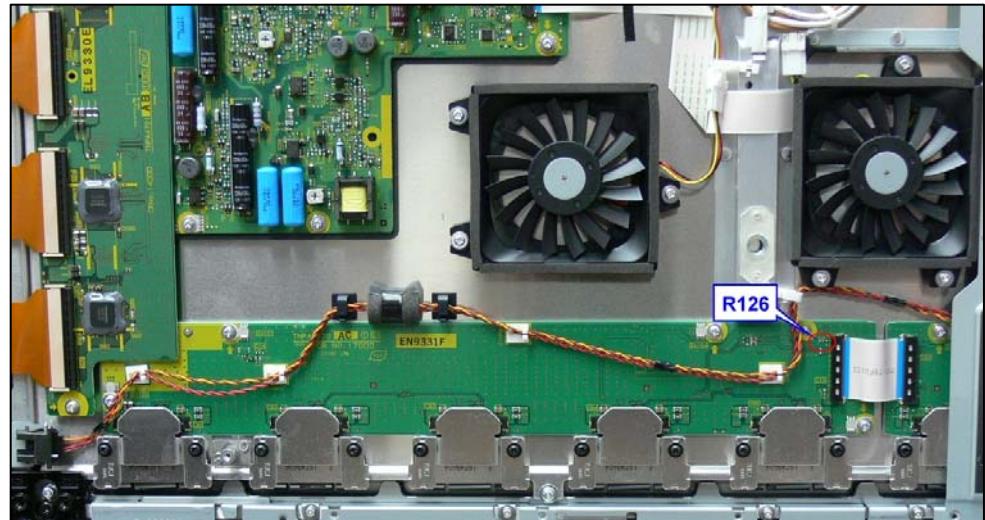
P3.3V Distribution (Detailed)



Troubleshooting 3 Blinks Error Code

These 3 conditions can cause the TV to shutdown and the power LED to blink 3 times

1. Missing P3.3V
2. A short of the P3.3V
3. Wrong diagnostic by the DA board



When troubleshooting a PDP TV that is shutting down and the power LED blinks 3 times:

Find out if 3.3V is output at R126 (R17126 on the service manual) . If 3.3V is present, it's likely that the DA board is defective.

If no voltage is output, determine if this is caused by the P board or the boards using the P3.3V.

To check for a short circuit, measure the resistance between R126 on the C1 board (**See figure ?**) and ground (Chassis). If P3.3V is shorted, find out if the short is coming from the DA board or if it's coming from any of the C boards or the panel.

The defective board is found when the connector that provides the P3.3V to that board is removed and the short circuit is no-longer present.

The boards that can possibly cause the TV to shutdown with 3 blinks of the power LED are:

DA – 80% Probability, Panel – 70% Probability, C2 – 50%, C1 – 5%, C3 – 5%

Troubleshooting 4 Blinks Error Code

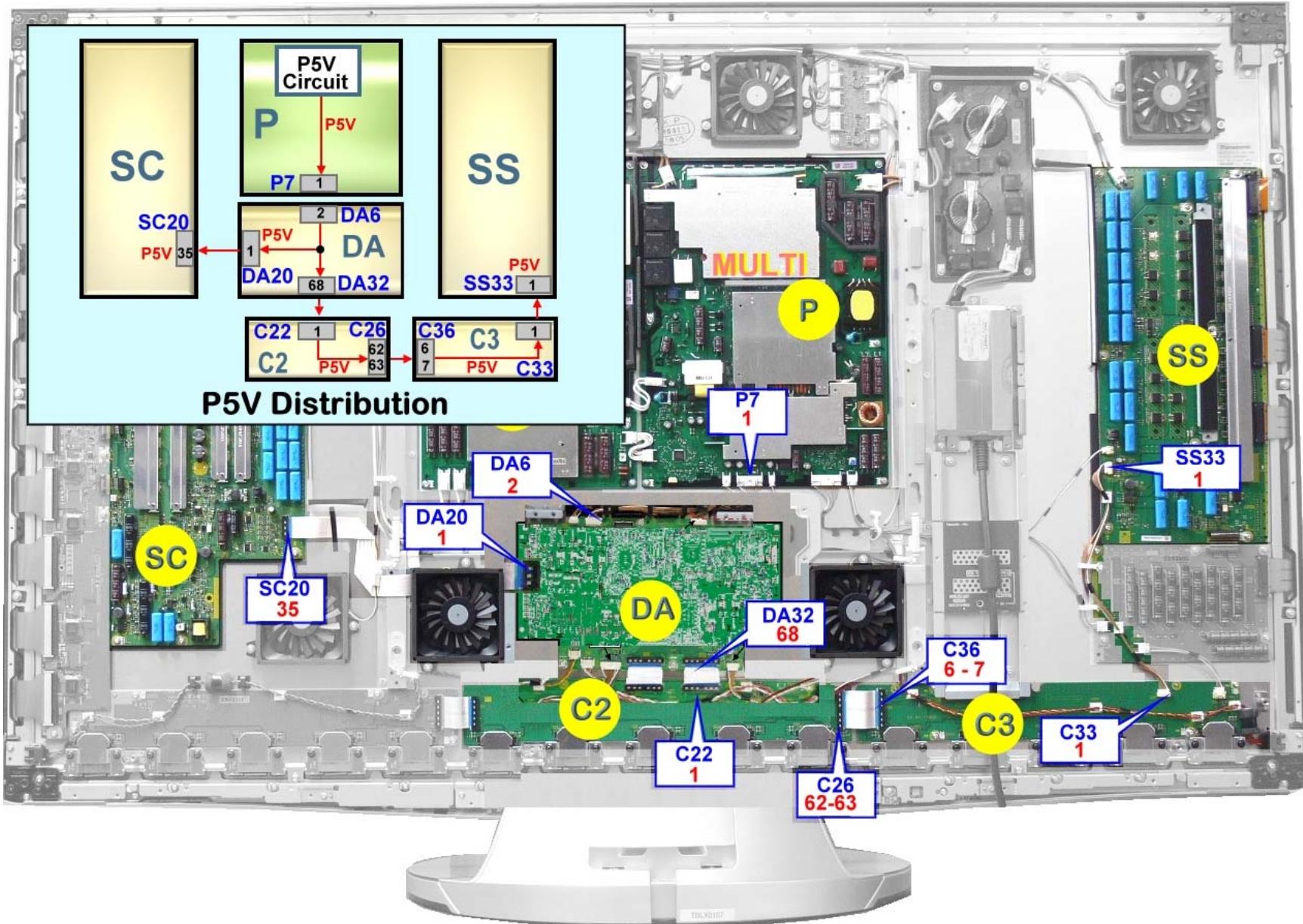
The voltage generated by the power supply are monitored by IC701. If there is an increase in voltage, IC701 outputs a high to the DA board.

Primarily the P board causes 4 blinks, followed by the DA board.

To troubleshoot a 4 blinks condition, measure the voltage at pin 18 of connector DA6 in the DA board. If the voltage goes high, the P board is the problem. If the voltage stays low, then the A board is the problem.

P – 95% Probability, **DA** – 50%

P5V Distribution



Troubleshooting 5 Blinks Error Code

These 4 conditions can cause the TV to shut down and the power LED to blink 5 times

1. Missing P5V
2. A short of the P5V
3. A short of the Vda line (Note: missing Vda from the P board does not cause 5 blinks)
4. Wrong diagnostic by the DA board

When troubleshooting a PDP TV that is shutting down and the power LED blinks 5 times:

Vda short circuit check

Find out if pins 1 or 2 of connector P35 are shorted to ground. If shorted, possibly the panel is bad. If there is no short circuit, proceed to check the P5V line.

P5V check (Missing/shorted)

Find out if 5V is output at pin 1 of connector P7 of the P board.

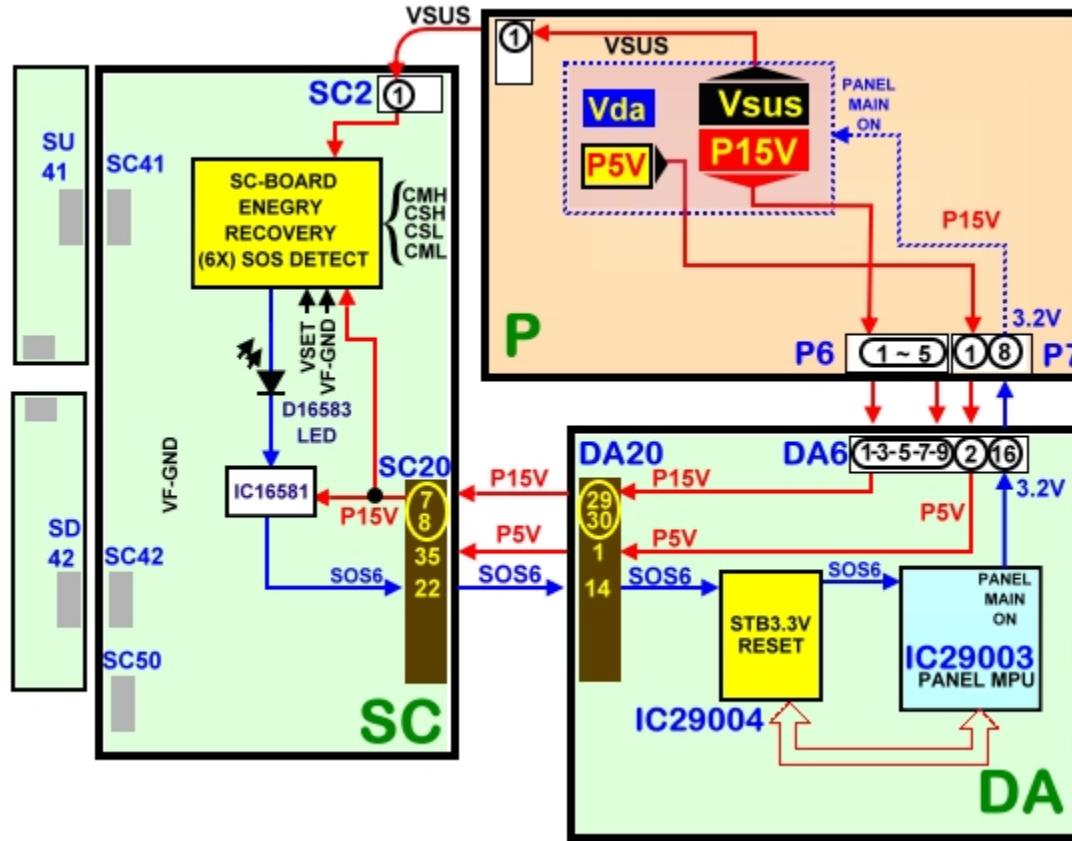
If no voltage is output, measure resistance between pin 1 of connector P7 and ground (Chassis). If P5V is shorted, find out if it's created on the P board or if it's created on any of the other boards that the 5V volt is connected to.

If the P board is OK, disconnect the connectors providing the P5V to all these boards while measuring resistance between pin 1 of connector P7 and ground.

The defective board is found when the connector that provides the P15V to that board is removed and the short circuit is no-longer present.

DA – 60%, P – 50% Probability, SS – 30% Probability, SC – 30% Probability, C2 – 5%, C3 – 5%

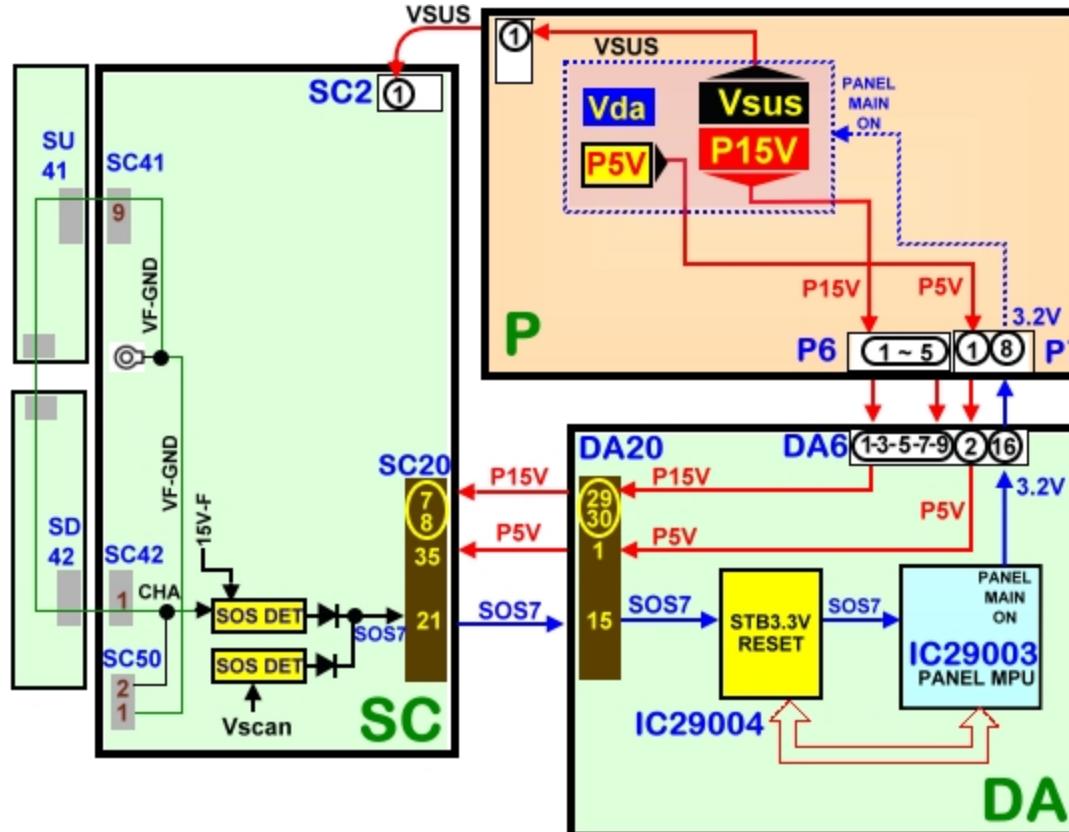
6 Blinks Error Code



The Scan and Sustain voltages on the SC and SS boards are monitored by an SOS Detect circuit. The energy recovery circuit in the SC board is monitored by a comparator (Error detect IC16581). The output voltage is compared to 2 reference voltages derived from the P15V. If the output of this circuit drops below 5.2 or goes above 11.8V, the output of the comparator IC6581 goes high to trigger the "Energy Recovery" SOS line. This high is provided to the Panel CPU on the A board. The TV shuts down and the power LED blinks 6 times.

SC – 95%, **DA** – 50% Probability, **P** – 20% Probability, Connections between **DA** and **Cs** - 30%

Troubleshooting 7 Blinks Error Code



The SC board has 2 SOS detect circuits, energy recovery and floating ground section.

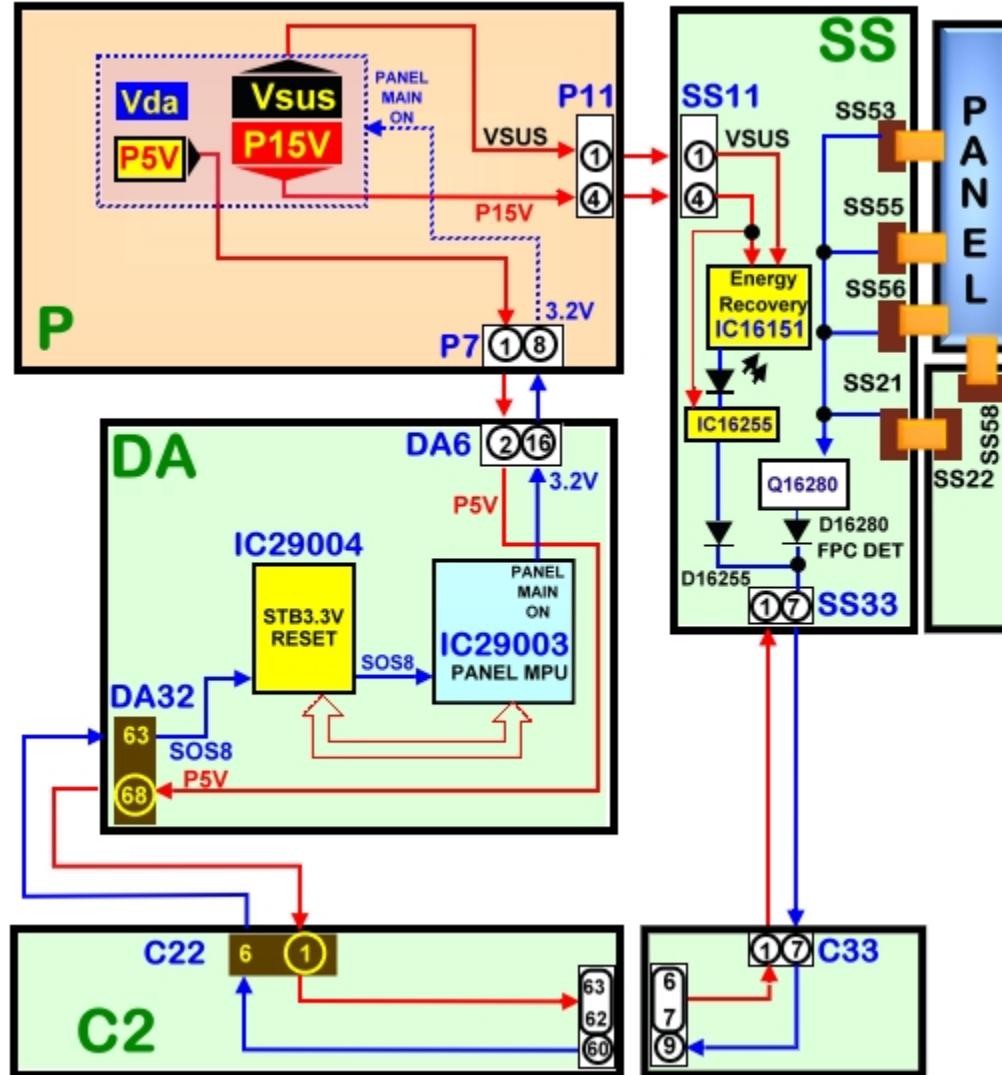
When the energy recovery circuit is triggered, the TV shuts down and the power LED blinks 6 times.

The floating ground circuit monitors the scan circuit output, the 15V_F, the scan_pro, Vscan, and the physical connection between the SC board and the SU/SD board (CHA).

If any abnormality occurs on any of these lines or Vsus is missing, the TV shuts down and the power LED blinks 7 times. If any of the connectors between the SC and the SU/SD board is open, the TV also shuts down and the power LED blinks 7 times.

SC – 80%, SU/SD – 60% Probability, DA – 20% Probability, P – 20% Probability

Troubleshooting 8 Blinks Error Code



Troubleshooting 8 Blinks Error Code

There is an extra SOS Detect circuit in the Sustain board. This circuit is used to monitor for physical connection between the panel and the SS board. Under normal condition, Q16280 is on.

When Q16280 is on, a low is provided to the anode of D16280 (D280). If one of the FPC cables is open, Q16280 turns off and a high is provided to the anode of D16280 (D280). This high is provided to pin 66 of the CPU in the A board. When this happens, the TV shuts down and the power LED blinks 8 times.

The energy recovery circuit is also used to monitor the operation of the sustain drive circuit. If this circuit is triggered, a high is provided to the anode of D16255 to trigger a shutdown.

To determine if the 8 blinks is caused by the A board, SS board, or the Panel:

- Isolate the SS board and check if the TV stays on when it's turned on.
- If the TV does not stay on after disconnecting the SS board, the A board is defective.
- If the TV stays on, then the SS or the Panel is defective.
- If the anode of D16280 (D280) is high (2.7V) at the time the unit shuts down, the Panel might be defective. (Check for loose connection between the flex-cables and the SS board).
- If the anode is low, the SS board is defective.

SS – 90%, Connections between the SS board and the Panel – 40% Probability, **Panel** – 25%, **DA** – 25%

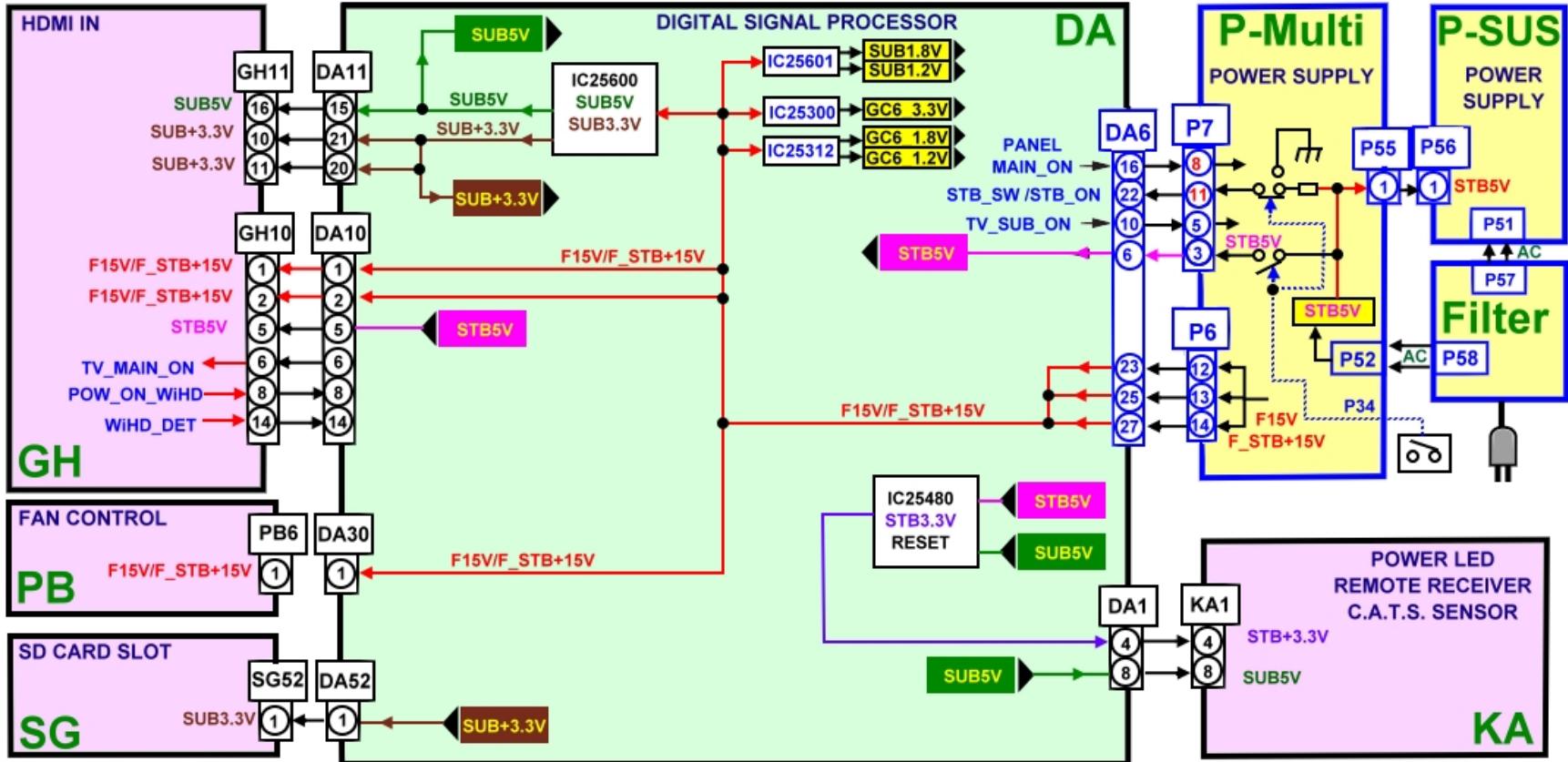
Troubleshooting 9 Blinks Error Code

A 9 blinks error code is normally caused by a defective DA board.

Check for metal object inside the SD card slot.

Also double check for loose connection around the DA board.

10 Blinks Error Code



Troubleshooting 10 Blinks Error Code

These conditions can cause the TV to shutdown and the power LED to blink 10 times

1. Missing/Shorted F_STB_15V, SUB5V, SUB3.3V, SUB1.8V SUB1.2V, GC6-3.3V, and GC6-1.8V, and GC6-1.2V.
2. Wrong diagnostic by the DA board

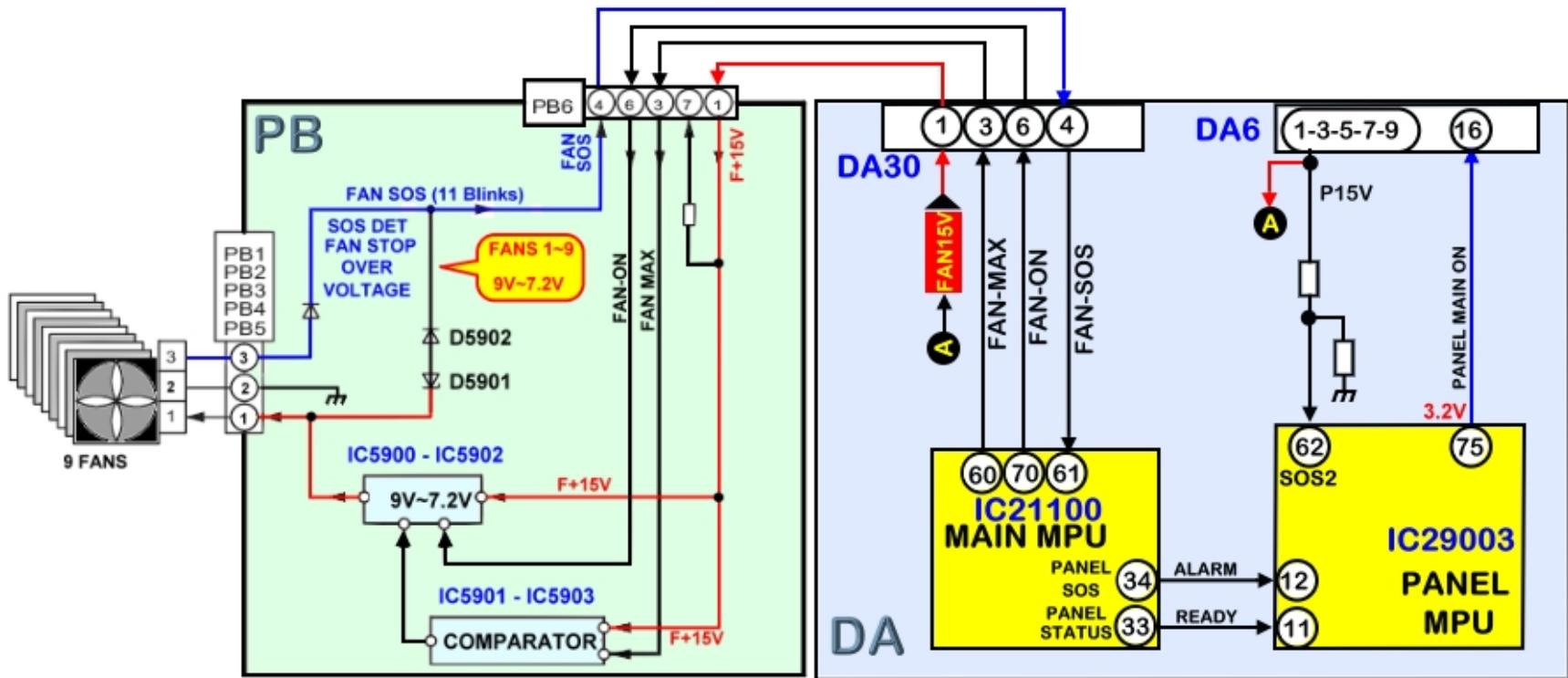
Note: When taking voltage reading, place the voltmeter probe at the test point, component, or connector's pin indicated before connecting the TV to the AC line. This will ensure voltage reading accuracy before the TV shuts down.

To troubleshoot a PDP TV that is shutting down and the power LED blinks 10 times:

- Find out if 15V is output at pin 12,13,or 14 of connector P6 of the P board. If no voltage is output, the P board may be defective.
- If the F_STB_15V voltage is OK, it's likely that the DA board is defective.

P – 75%, DA – 60% Probability, P – 20% Probability, SG, PB, GH, and KA - 10% Probability

Fan Drive Circuit



Troubleshooting 11 Blinks Error Code

The ventilation fans are monitored to be sure they are operating properly. If one of the fans stops or its resistance increases, the resulting current change is applied to pin 61 of the main CPU.

The fan drive circuit is located in the A board.

The Panel-Main-On command from pin 70 of the Panel MPU (IC21100) turns on the fan control ICs (IC5900 and IC5902).

An increase in temperature of the TV is detected by the temperature sensor (IC2100). This IC communicates with the main MPU (IC21100) through the Peaks IIC1 bus line.

To control the speed of the fan, a Fan-Max command from pin 60 of IC21100 is output to the fan control ICs in the PB board. (IC5901 and IC5903)

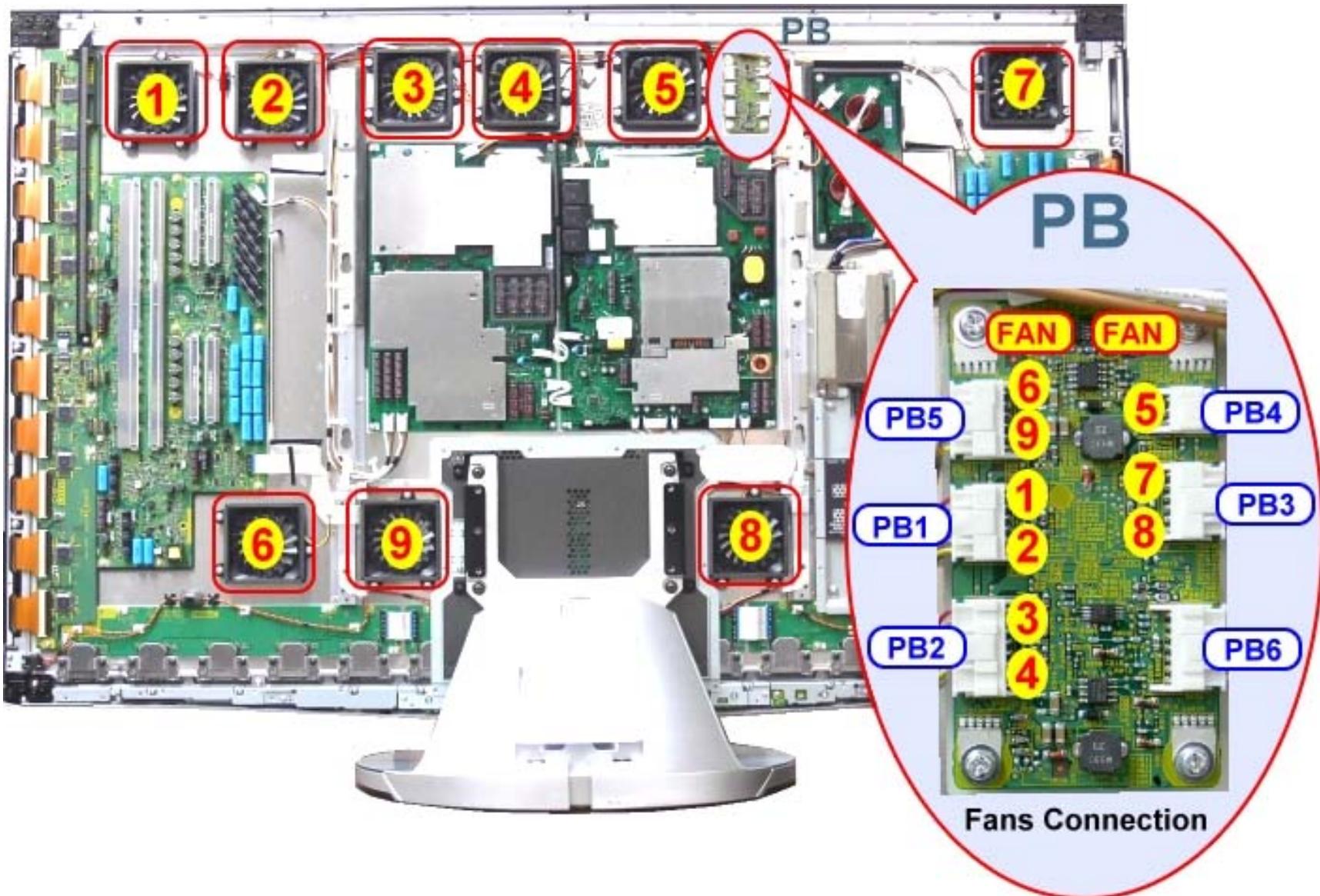
To keep the unit cool, the fan control voltages from IC5900 and IC5902 range between 7.2V and 11V. IC5900 supplies voltage to drive fans 1, 2, 5, 6, 7, 8, and 9.

IC5902 supplies voltage to drive fans 3 and 4.

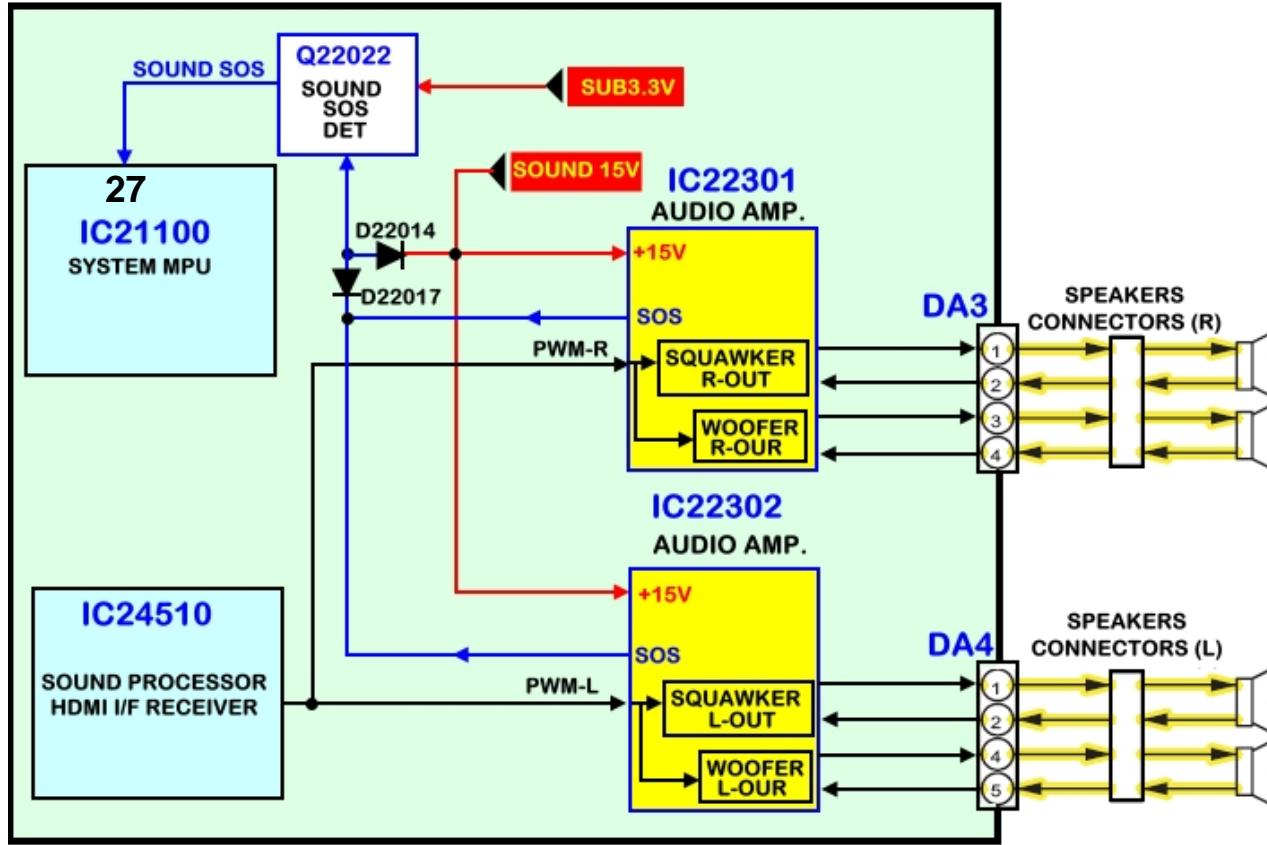
If the output of IC5900 exceeds 12V, the diode (D5901) conducts. The resulting voltage is applied to pin 60 of IC21100 to trigger the SOS condition. The TV shuts down and the power LED blinks 11 times.

If any of the fans becomes defective and stops or the fan connector is removed, A high is output at pin 3 of the fans connector to forward bias the inline diode. The DC output of the diode is provided to pin 61 of the MPU (IC21100) to trigger the SOS condition.

Fans Location



12 Blinks Error Code



Sound processing and adjustments are performed by IC24510. The 4 channels PWM audio output of the IC is applied to the 2 audio power amplifiers (IC22301 and IC22302). The PWM signals of the power amplifiers are output to the right and left channel speakers for sound reproduction.

D22017 monitors the audio power amplifier ICs (IC22301 and IC22302) for excessive current drain. If any of the 2 ICs or one of the speakers develops a short circuit, a high is output to turn on Q22022. When Q22022 is on, a high is applied to pin 27 of the System MPU (IC21100) triggering an SOS condition. Then unit shuts down and the power LED blinks 12 times.

A short circuit of the 15V line causes the diode D22014 to go into conduction. The base voltage of Q22022 becomes low and a high is output to pin 27 of IC21100 triggering a 12 blinks SOS condition.

Service Mode

The Tuner box and The Display unit have individual service modes.

Service Mode (Tuner)

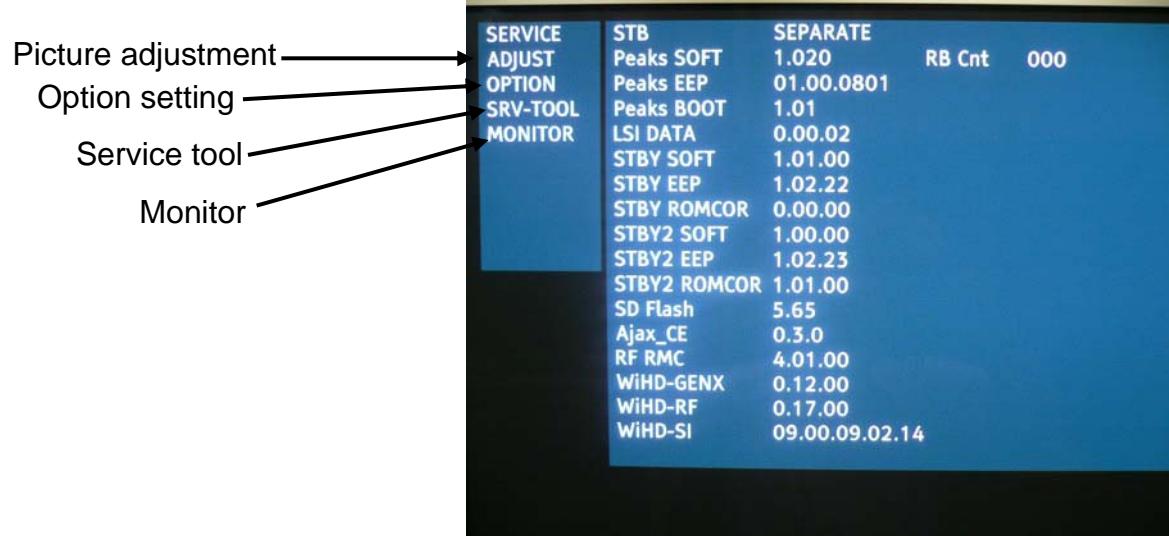
Tuner box Service Mode.

How to enter:

(Use the RF Remote Control)

Press and hold the **Volume [-]** button of Tuner Box and while holding down this button, press the **[Info]** button on RF remote control 3 times within 2 seconds.

Display screen (Blue background)



Key command

“1” button --- Main items Selection in forward direction

“2” button --- Main items Selection in reverse direction

“3” button --- Sub items Selection in forward direction

“4” button --- Sub items Selection in reverse direction

“VOL” button --- Value of sub items change in forward direction (+), in reverse direction (-).

How to exit : Disconnect the AC cord of tuner box and display unit from the wall outlet.

Service Mode (Display Unit) (Monitor Mode)

Display Unit Service Mode.

There are 2 ways to enter the Display Service Mode:

- By selecting “**MONITOR**” from the **Tuner Box Service Mode** menu (Using the RF remote control)
- By pressing the **VOL –** button on the **Display Unit** and the “**INFO**” button on the IR remote control 3 times within 2 seconds. (**Display Unit Unique Mode**) (Using the IR remote control)

How to enter from Tuner Box Service Mode:

Use RF Remote control.

- 1) Press and hold the **Volume [-]** button of tuner box and while holding this button, press the **[Info]** button of remote control 3 times within 2 seconds.

The Tuner Box Service mode screen is displayed. (Blue background)

- 2) Using the buttons 1 or 2 on the remote control select “**MONITOR**” from the menu and then press the **[OK]** button.

- 3) **[MONITOR MODE]** will be displayed on the top-left of the screen .

A screenshot of a blue-themed service menu. On the left, there's a vertical list of options: SERVICE, ADJUST, OPTION, SRV-TOOL, and MONITOR. The 'MONITOR' option is highlighted with a red circle and a yellow octagonal callout containing the number '2'. To the right of the list is a table with two columns: 'STB' and 'SEPARATE'. The table lists various parameters like Peaks SOFT, Peaks EEP, Peaks BOOT, LSI DATA, STBY SOFT, STBY EEP, etc., each with its corresponding value. A yellow octagonal callout containing the number '1' is positioned in the top right corner of the table area.

STB	SEPARATE
Peaks SOFT	1.020
Peaks EEP	01.00.0801
Peaks BOOT	1.01
LSI DATA	00.00.02
STBY SOFT	1.01.00
STBY EEP	1.02.22
STBY ROMCOR	00.00.00
STBY2 SOFT	1.00.00
STBY2 EEP	1.02.23
STBY2 ROMCOR	1.01.00
SD Flash	5.65
Ajax_CE	0.3.0
RF RMC	4.01.00
WIHD-GENX	0.12.00
WIHD-RF	0.17.00
WIHD-SI	09.00.09.02.14



MONITOR MODE' continues to be displayed on the top-left of the screen

A screenshot of a green-themed service menu. On the left, there's a vertical list of options: SERVICE, ADJUST, WB-ADJ, OPTION, AGING, and SRV-TOOL. The 'OPTION' option is highlighted with a red circle and a yellow octagonal callout containing the number '4'. To the right of the list is a table with four columns: 'MONITOR', 'SEPARATE', 'OPTION 1', and 'OPTION 2'. The table lists various parameters like Peaks SOFT, Peaks EEP, LSI DATA, STBY SOFT, etc., each with its corresponding value. A yellow octagonal callout containing the number '4' is positioned in the bottom right corner of the table area.

MONITOR	SEPARATE	OPTION 1	OPTION 2
Peaks SOFT	2.003	ff	ff
Peaks EEP	12.00.0795	ff	ff
LSI DATA	0.00.05	ff	ff
STBY SOFT	1.00.00	ff	ff
STBY EEP	1.02.24	ff	ff
STBY ROMCOR	1.00.00	ff	ff
PDP SOFT	02.51	ff	ff
PDP EEP	63.50	ff	ff
PDP FPGA	51.02	ff	ff
PDP PDROM	63.20	ff	ff
WIHD-GENX	0.12.00	ff	ff
WIHD-RF	0.17.00	ff	ff
WIHD-SI	09.00.09.02.14	ff	ff

- 4) Press the **Volume [-]** button of **Display unit** + **[Info]** button of **RF remote control** 3 times within 2 seconds. The Display Unit Service Mode menu is displayed.

How to exit :

Disconnect the AC cord of the tuner box and display unit from the wall outlet or press and hold the power Switch for 5 seconds.

Display Unit Service Mode (Display Unit Unique Mode)

Display Unit Service Mode.

The Display Unit does not have to be connected to the Tuner Box to enter the Display Service Mode

Use this procedure when performing white balance adjustment.

How to enter:

Use IR Remote control.

Press and hold the **Volume [-]** button of Display Unit and while holding this button, press the **[Info]** or “**Recall**” button of the IR remote control 3 times within 2 seconds.

Service mode of display unit is displayed.

Note: The menu has a green background and “MONITOR MODE” is not displayed on the top-left side of the screen

SERVICE	MONITOR	SEPARATE	OPTION 1	ff
ADJUST	Peaks SOFT	2.003	OPTION 2	ff
WB-ADJ	Peaks EEP	12.00.0795	OPTION 3	ff
OPTION	LSI DATA	0.00.05	Model ID	06
AGING	STBY SOFT	1.00.00		02ff3200
SRV-TGOL	STBY EEP	1.02.24		00004000
	STBY ROMCOR	1.00.00		
	PDP SOFT	02.51	RB Cnt	002
	PDP EEP	63.50		
	PDP FPGA	51.02		
	PDP PDROM	63.20		
	WiHD-GENX	0.12.00		
	WiHD-RF	0.17.00		
	WiHD-SI	09.00.09.02.14		

How to exit:

Disconnect the AC cord of display unit from the wall outlet .

Self Check/Reset (Tuner Box)

How to enter:

Use RF Remote control.

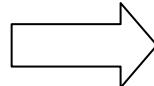
Self check indication only:

Press volume [-] button of tuner box and [OK] button of RF remote control at the same time for more than 3 seconds.

Reset: (This will cancel the RF remote control registration)

Note: The RF remote control won't work after resetting the Tuner Box. The remote control has to be registered again in order to work.

Press volume [-] button of tuner box and [MENU] button of RF remote control at the same time for more than 3 seconds.



DISPLAY	Ref. No.	Description	P.C.B.
PEAKS	IC8001	PEAKS AVC	A-Board
TUN1	TU8300	TUNER (PLL block)	A-Board
TUN2	TU8300	TUNER (MTS block)	A-Board
FE	IC8300	FRONT END PROCESSOR	A-Board
AVSW	IC3001	AUDIO/VIDEO SW	A-Board
ADV	IC4510	ADV7471 (ADV7496)	A-Board
ADAV	IC4510	ADV7471 (ADAV4622)	A-Board
GenX	IC1100	SYSTEM MPU	A-Board
MEM1	IC1101	EEPROM (SYSTEM MPU)	A-Board
MEM2	IC8502	EEPROM (Peaks)	A-Board
MEM3	IC1501	EEPROM (CEC)	A-Board
TEMP	IC4701	TEMP SENSOR	A-Board
GC6	IC5100	GC6	A-Board
GenX2	IC1500	SYSTEM MPU CEC	A-Board
KYOTO	IC9005	KYOTO	DH-Board
HDMI Tx	IC9004	HDMI Tx	DH-Board
RFRMC	IC7002	RF REMOTE CONTROL	RM-Board

How to exit : Disconnect the AC cord of display unit from the wall outlet.

Self Check (Display Unit)

How to enter:

Use RF Remote control.

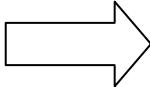
After setting to Monitor Mode,

Self check indication only:

Press volume [-] button of tuner box and [OK] button of RF remote control at the same time for more than 3 seconds.

Reset:

Press volume [-] button of tuner box and [MENU] button of RF remote control at the same time for more than 3 seconds.



DISPLAY	Ref. No.	Description	P.C.B.
ADV	IC24510	ADV7471 (ADV7496)	DA-Board
ADAV	IC24510	ADV7471 (ADAV4622)	DA-Board
GenX	IC21100	SYSTEM MPU	DA-Board
MEM1	IC21101	EEPROM (SYSTEM MPU)	DA-Board
MEM2	IC28502	EEPROM (Peaks)	DA-Board
PANEL	IC29003	PANEL MICOM	DA-Board
TEMP	IC21000	TEMP SENSOR	DA-Board
GC6	IC25100	GC6	DA-Board

When there is picture problem caused by the Tuner, the tuner "Self Check" may not be displayed but the Display "Self Check" can be done using the IR remote control.

(Display unit unique mode) (Use the IR remote control)

Press volume [-] button of display unit and [OK] or [MENU] button of IR remote control at the same time, then self check (green color) is displayed. (MONITOR is not shown at left top.)

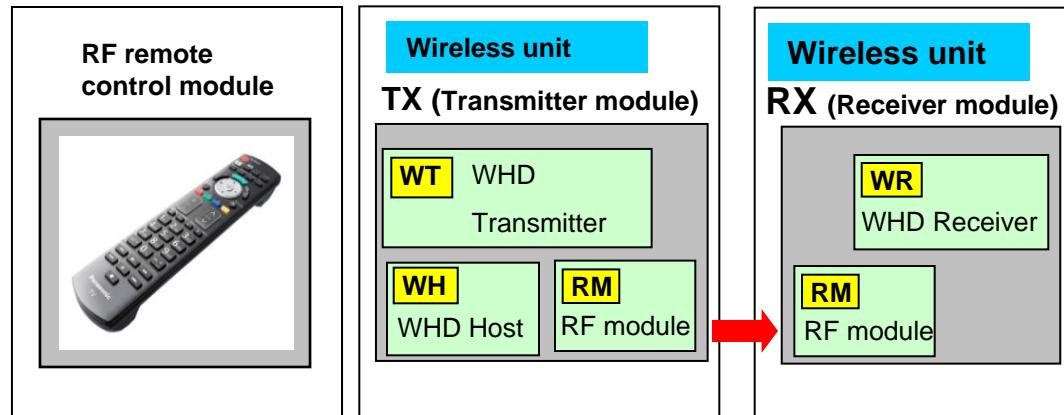
How to exit : Disconnect the AC cord of display unit from the wall outlet.

Wireless Unit Replacement (TX/RX modules + RF remote control)

The RF remote control is included when the TX module is ordered. Therefore when TX and RX are replaced, the RF remote control is also changed.

The TX and the RX are automatically paired when they are connected to the Tuner and the Display Unit respectively.

The new remote control has to be registered before it can be used.



To establish connection between the transmitter module and the receiver module:

Connect the TX and the RX to the Tuner unit and the Display unit respectively.

Press the power button on the Tuner unit. (The tuner turns on)

Press the power button on the Display unit. (The display turns on)

The red LED on the TX and the RX should turn ON. When connection between TX and RX is established the LEDs turn green and the picture appears.

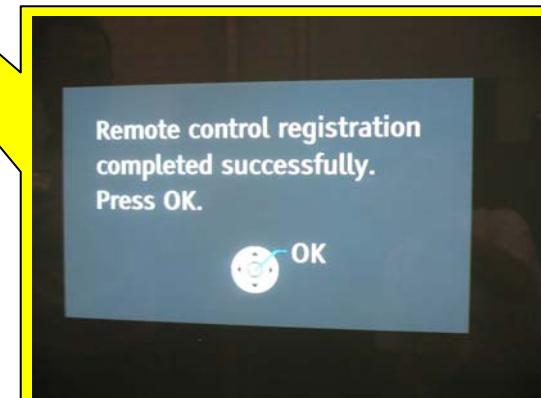
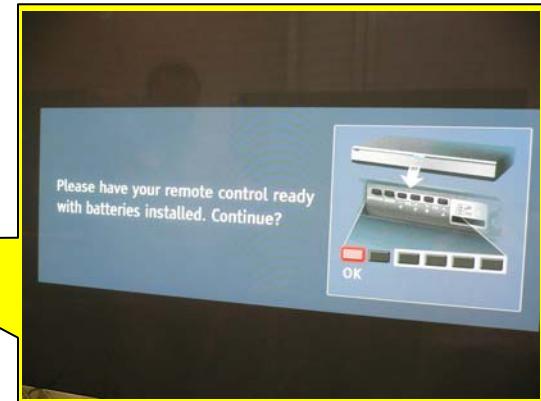
RF Remote Control First Time Registration

Registration of RF remote control to the tuner box is required before operating the TV

How to register

First registration after purchase

1. Turn the power on and when the registration screen appears, press the **Menu** button on the Tuner Box.
2. Press the “**OK**” button and the number “**1**” button on RF remote control simultaneously. **Note:** the registration may take 30 seconds.
3. Press the “**OK**” button when the “**Remote control registration complete successfully**” menu appears.
4. Press the “**OK**” button and proceed to the “Easy installation setting”



Only 5 RF remote controls can be registered at a time.
To add another remote, all 5 registered remote controls have to be erased first.

It's not possible to erase just one remote control if one of several are already registered.

How to Register Additional Remote Controls

A new Remote Control has to be registered first before it can operate the unit.

Press and hold the “**MENU**” button on the **Tuner Box** until the “**Remote Control Registration**” menu appears.

1. Use the “VOL -” key of the tuner box to select “Yes” when the “Register additional remote control?” appears.
2. Press the “Input/OK” button on the Tuner Box.
3. Press the “Input/OK” button and the “1” button simultaneously for at least 3 seconds.

Note: The registration may take 30 seconds.

4. When the screen “Registration Completed” is displayed, press the “Return” button on the remote control to finish the registration.

If the remote control registration fails

Press and hold the power button until the tuner box turns on. If the power can't be turned on this way, unplug and reconnect the Ac cord and then press the power switch.

Press the “**MENU**” button on the tuner box for 5 seconds.

Follow the steps to register again.

Glossary

Resolution

Resolution is a combination of values that express the quality of displayed images. A display's resolution is indicated by the number of dots in the horizontal and vertical directions of the screen, such as 1024 x 768 dots. Higher values indicate clearer, sharper image reproduction. The larger the screen size, the higher the required resolution.

HD (high-definition) panel

The HD panel has a resolution of 1,366 x 768 pixels and an aspect ratio of 16:9. It is designed for displaying the beautiful images of digital, high-definition broadcasts.

Full HD (high-definition) panel

The term "full-HD panel" refers to 1,920 x 1,080-pixel panels that display progressive images of full-specification HDTV signals without the use of up sampling.

Number of pixels

The number of pixels indicates the resolution of the Image. The number of pixels of a digital image is expressed by the product of the number of pixels (dots) in the horizontal direction and the number of pixels (dots) in the vertical direction. The higher the number of pixels, the better the image quality. For plasma TVs and LCD TVs, the number of pixels is sometimes expressed by the following equation: number of pixels in horizontal direction x number of pixels in vertical direction x 3 (R, G, B).

Pixel

A pixel is a tiny dot that forms the smallest basic unit of a displayed image. Digital images are composed of pixels, with all of the text and images displayed on the screen consisting of dots. Digital images are usually rendered by square pixels arranged vertically and horizontally in an orderly manner.

Plasma panel

A key component of the plasma display. A plasma panel is a collection of millions of tiny fluorescent lights. By firing these lights on and off at a rapid rate, the plasma panel produces images.

Glossary

THX

THX is a trade name of a high-fidelity sound reproduction standard for movie theaters, screening rooms, home theaters, computer speakers, gaming consoles, and car audio systems. THX stands for **Tomlinson Holman's eXperiment**.

The THX system is not a recording technology, and it does not specify a sound recording format: all sound formats, whether digital (Dolby Digital, SDDS) or analog (Dolby Stereo, Ultra-Stereo), can be "shown in THX." THX is mainly a quality assurance system.

THX-certified theaters provide a high-quality, predictable playback environment to ensure that any film soundtrack mixed in THX will sound as near as possible to the intentions of the mixing engineer.

AVCHD

Advanced Video Codec High Definition is a high-definition and standard-definition recording format for use in digital tape-less camcorders and digital cameras. It is based on the H.264/MPEG-4 AVC video compression standard. Audio is stored in compressed form (Dolby AC-3). The container format for the audio and video is MPEG transport stream.

H.264

H.264 is a standard for video compression, and is equivalent to **MPEG-4 Part 10**, or **MPEG-4 AVC** (for **Advanced Video Coding**). As of 2008, it is the latest block-oriented motion-compensation-based codec standard. The final drafting work on the first version of the standard was completed in May 2003.

The intent of the H.264/AVC project was to create a standard capable of providing good video quality at substantially lower bit rates than previous standards (e.g. half or less the bit rate of MPEG-2, H.263, or MPEG-4 Part 2), without increasing the complexity of design so much that it would be impractical or excessively expensive to implement.

YUV

YUV is used for a specific analog encoding of color information in television systems
Y' stands for the luma component (the brightness) and U and V are the chrominance (color) components.

YUV

Glossary

Is The color encoding system used for analog television worldwide (NTSC, PAL and SECAM). The YUV color space differs from RGB, which is what the camera captures and what humans view.

Composite Video and S-video

The original TV standard combined luma (Y) and both color signals (B-Y, R-Y) into one channel, which uses one cable and is known as "composite video." An option known as "S-video" or "Y/C video" keeps the luma separate from the color signals, using one cable, but with separate wires internally. S-video is a bit sharper than composite video.

Component Video

When luma and each of the color signals (B-Y and R-Y) are maintained in separate channels, it is called "component video," designated as YPbPr when in the analog domain and YCbCr when it is digital.

TMDS

Transition Minimized Differential Signaling

CEC

Consumer Electronics Control

DDC

Display Data Channel

Standardized by VESA (Video Electronics Standard Association), DDC allows the acquisition of all types of attributes and automatic settings to match the capabilities of the display. An expanded version, DDC/CI (Command Interface), has bidirectional control capability.

Buffer

A buffer is a circuit that compensates for differences in processing speed between communication lines, eliminating input/output interference.

Equalizer

Longer cables result in proportional degradation of the digital signal, making it increasingly difficult to distinguish between ones and zeroes. An equalizer is a circuit that restores this degraded signal, so that subsequent digital blocks can correctly determine the digital value.

Buffer

A buffer is a circuit that compensates for differences in processing speed between communication lines, eliminating input/output interference.

The End